VAX 4000 Model 105A/106A

Operator Information

Order Number: EK–513AA–OP. B01

May 1995

This manual describes how to operate VAX 4000 Model 105A and 106A systems.

Digital Equipment Corporation
Maynard, Massachusetts

May 1995

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This document was prepared using VAX DOCUMENT Version 2.1.

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Preface

This manual describes how to operate VAX 4000 Models 105A and 106A systems. It also contains information on using software storage devices, connecting the system to a network, and connecting hardware options to the system.

Audience

This manual is intended for anyone using a VAX 4000 Model 105A or 106A system. It is written for both experienced and inexperienced users.

Structure of This Manual

This manual is divided into four chapters, two appendixes, a glossary, and an index:

- Chapter 1 describes Model 105A and Model 106A systems.
- Chapter 2 describes how to use the software storage and loading devices that are internal to the systems.
- Chapter 3 describes how to connect the systems to a network.
- Chapter 4 describes how to connect hardware options to the systems.
- Appendix A gives the list of associated and related documents.
- Appendix B describes how to handle and care for removable software storage media.
- Appendix C describes how DSSI devices are programmed.
- The glossary defines some of the technical terms used in this manual.

Additional Information

See Appendix A for the list of associated and related documents.

Conventions

The following conventions are used in this manual:

Convention	Description
MONOSPACE	Text displayed on the screen is shown in monospace type.
boldface type	Boldface type in examples indicates user input. Boldface type in text indicates the first instance of terms defined either in the text, in the glossary, or both.
italic type	Italic type emphasizes important information, indicates variables, and indicates complete titles of manuals.
nn nnn.nnn nn	A space character separates digits in numerals with 5 or more digits. For example, *10 000* equals *ten thousand*.
n.nn	A period in numerals signals the decimal point indicator. For example, *1.75* equals *one and three-fourths*.
UPPERCASE	Words in uppercase indicate a command.
n	A lowercase italic *n* indicates the generic use of a number. For example, 19*nn* indicates a 4-digit number in which the last 2 digits are unknown.
Note	A note contains information of special importance to the reader.
Caution	A caution contains information to prevent damage to the equipment.
Warning	A warning contains information to prevent personal injury.

1

VAX 4000 Model 105A/106A Hardware

This chapter describes the VAX 4000 Model 105A and 106A system units. It covers the following:

- The Model 105A/106A system unit
- Terminal settings
- System unit icons

1.1 System Unit Description

The VAX 4000 Model 106A system differs from the Model 105A system in two ways.

Table 1–1 Model 105A and 106A Differences

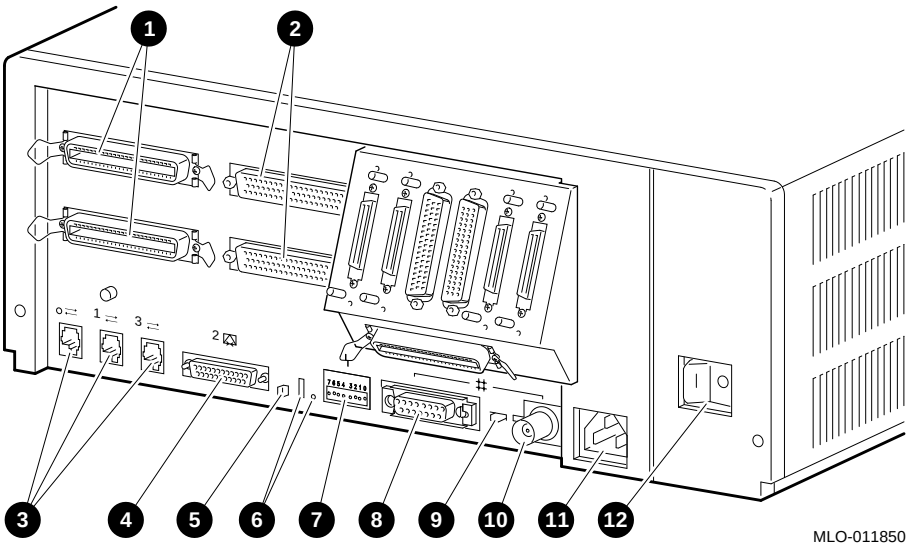
Model	CPU Module	DSSI Expansion Ports
105A	KA53	3
106A	KA54	4

Note

Illustrations in this manual show a VAX 4000 Model 106A system rather than a Model 105A system, unless otherwise noted.

See Figure 1–1 for the VAX 4000 Model 105A/106A system ports, controls, and LEDs.

Figure 1–1 VAX 4000 Model 106A System Ports, Controls, and LEDs



Note

Figure 1–1 shows a Model 106A system. If you have a Model 105A, the expansion box will not look the same. (Expansion boxes for both models are shown in detail elsewhere in this manual.)

❶ Optional Asynchronous Communications Ports A and B—These are the ports to which you can connect devices or options that use asynchronous communications. Port A is on the bottom.

❷ Optional Synchronous Communications Ports 0 and 1—These are the ports to which you can connect the devices or options that use synchronous communications. Port 0 is on the bottom.

❸ Modified Modular Jack (MMJ) Ports 0, 1, and 3—These are the ports to which you can connect the user terminal, printer or other devices that use asynchronous DEC423 data-line-only ports to the system unit. **The console terminal is always connected to port 3.**

❹ Asynchronous Modem Control Port (Port 2)—This is the port at which you can connect a modem, terminal, printer, or other devices that use EIA-232 ports to the system unit.

❺ Halt Button—This button halts the system and returns it from the operating system to console mode.

❻ Break/Enable Switch and LED—When the break/enable switch is in the up position, you can halt the system by pressing the break key on the console terminal keyboard. When the break/enable switch is in the up position, the LED is on. When the break/enable switch is in the down position, the LED is off.

❼ Diagnostic LEDs—The diagnostic LEDs (status LED display) indicate system and test status, and error conditions.

❽ Standard Ethernet Port—This is the port to which standard Ethernet connects to the system unit.

❾ Network Select Switch—This switch selects either ThinWire™ or standard Ethernet connection.

The system uses standard Ethernet when the network select switch is in the left-hand position. The system uses ThinWire Ethernet when the network select switch is in the right-hand position.

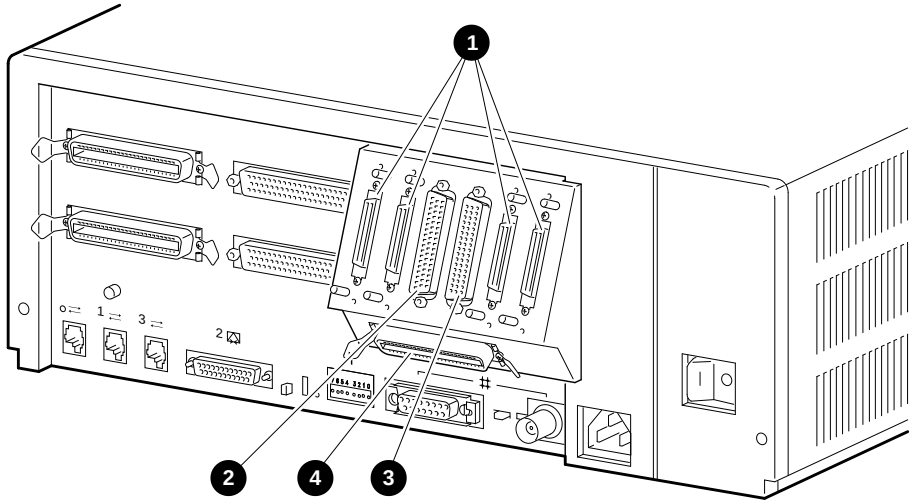
❿ ThinWire Ethernet Port—This is the port to which ThinWire Ethernet connects to the system unit.

⓫ System ac Power—The ac power cord plugs in here.

⓬ On/Off Switch—This switch turns the system unit on or off. To turn the system on, set the on/off switch to the on (|) position. To turn the system off, set the on/off switch to the off (O) position.

Figure 1–2 shows the expansion ports on a VAX 4000 Model 106A system.

Figure 1–2 VAX 4000 Model 106A System Expansion Ports



❶ DSSI ports—These ports enable connection of external DSSI devices to the system and the building of a DSSI-based VAXcluster.

❷ Q–bus port—This is a port through which the external Q–bus expander is connected to the computer system.

❸ Q–bus port—This is a port through which the external Q–bus expander is connected to the computer system.

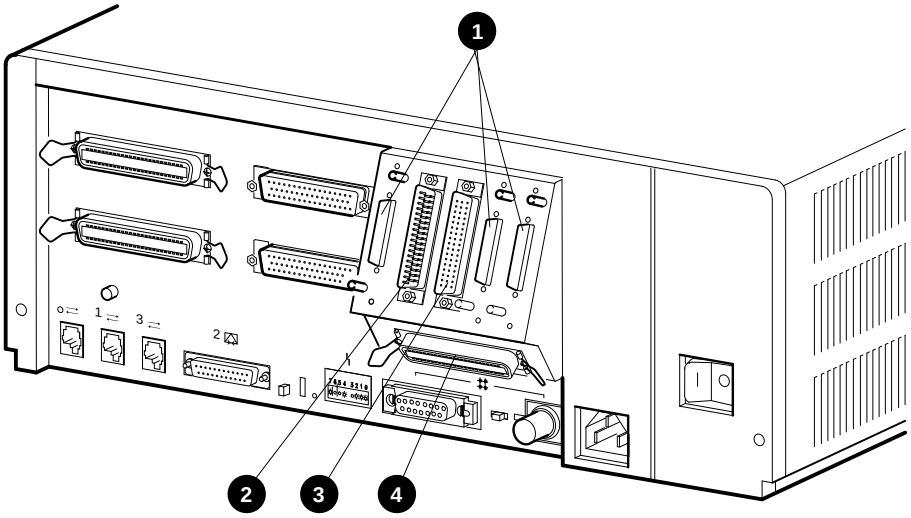
❹ SCSI port—This is the port to which small computer system interface (SCSI) storage devices connect to the system unit. The SCSI terminator is installed on this port when the unit is shipped.

Figure 1–3 shows the expansion ports on the VAX 4000 Model 105A.

Note

The VAX 4000 Model 105A has one less DSSI port on the expansion box than the Model 106A

Figure 1–3 VAX 4000 Model 105A Expansion Ports



❶ DSSI ports—These ports enable connection of external DSSI devices to the system and the building of a DSSI-based VAXcluster.

❷ Q–bus port—This is a port through which the external Q–bus expander is connected to the computer system.

❸ Q–bus port—This is a port through which the external Q–bus expander is connected to the computer system.

❹ SCSI port—This is the port to which small computer system interface (SCSI) storage devices connect to the system unit. The SCSI terminator is installed on this port when the unit is shipped.

1.2 Terminal Settings

Terminals must have the settings shown in Table 1–2 to communicate with the system unit on port 3:

Table 1–2 Terminal Settings

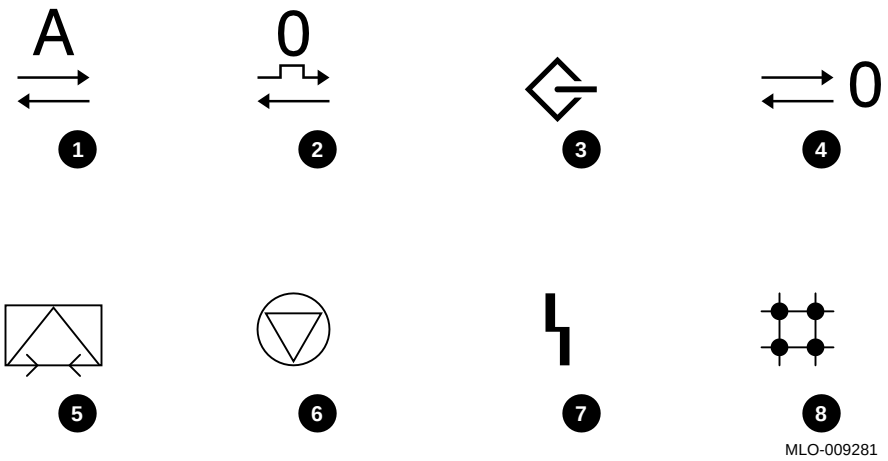
Feature	Setting
Terminal mode	VT*nnn*-7bit
Transmit speed	9600 baud
Receive speed	receive = transmit
Character format	8 bits, no parity
Stop bits	1
Comm1 port	DEC423 (data-leads-only)

See the terminal documentation for more information on setting up the terminal.

1.3 System Unit Icons

Figure 1–4 shows the system unit icons.

Figure 1–4 System Unit Icons



❶ This icon indicates optional asynchronous communications port A. A similar icon indicates the optional asynchronous communications port B.

❷ This icon indicates optional synchronous communications port 0. A similar icon indicates the optional asynchronous communications port 1.

❸ This icon identifies the SCSI port.

❹ This icon identifies a DEC423 MMJ port 0. Similar icons indicate MMJ ports 1 and 3.

❺ This icon identifies the asynchronous modem control port (port 2).

❻ This icon identifies the halt button.

❼ This icon identifies the status LED display.

❽ This icon identifies the standard Ethernet port, the network select switch, and the ThinWire Ethernet port.

2

Internal System Devices

This chapter describes how to access and operate the internal devices that are options of the system. The system can contain the following optional devices:

- TZ30 tape drive, bottom shelf only
- TZK10/TZK11 quarter-inch cartridge (QIC) tape drive, bottom shelf only
- TLZ06/TLZ07 cassette tape drive, bottom shelf only
- RRD42 compact disc drive, bottom shelf only
- RRD43 compact disc drive, bottom shelf only
- RX23/RX26 diskette drive, bottom shelf only
- RZ2x disk drives, bottom shelf only
- RF3x disk drives, top shelf only

This chapter also gives information on the following devices:

- Cleaning device drive heads
- System disk

Note

Appendix B contains information on the care and handling of the media types for each of the removable media devices. It also gives information on setting the write-protect switches on the diskettes and tapes.

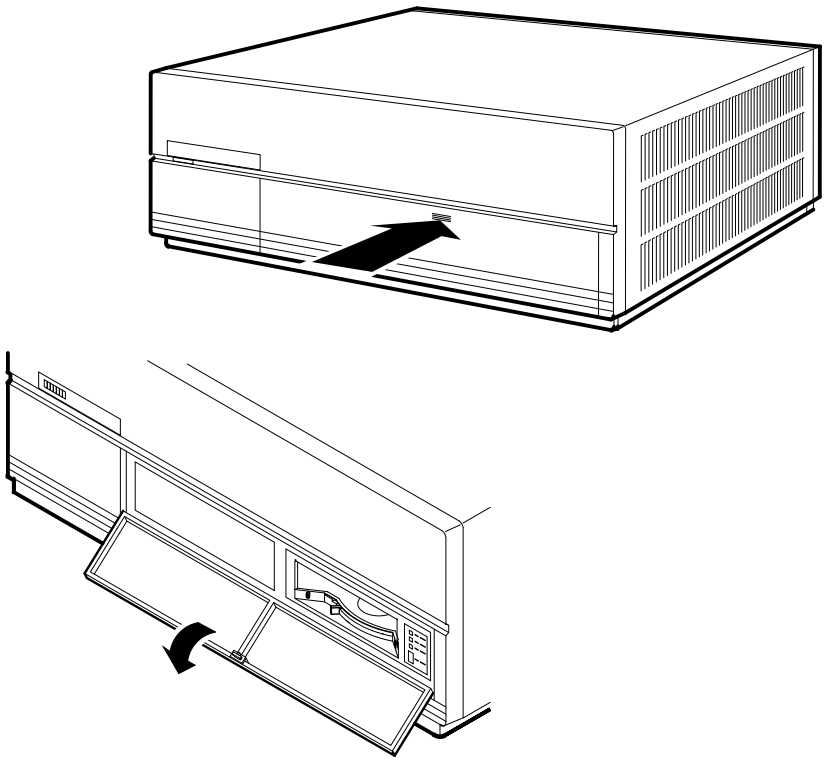
2.1 Accessing the Removable Media System Devices

To access the system devices, follow these steps:

1. Position the system unit so that the front of it is facing you.
2. Open the cover by pushing it and then releasing it, as shown in Figure 2–1.

Close the cover when you are not using the system devices.

Figure 2–1 Accessing Removable Media



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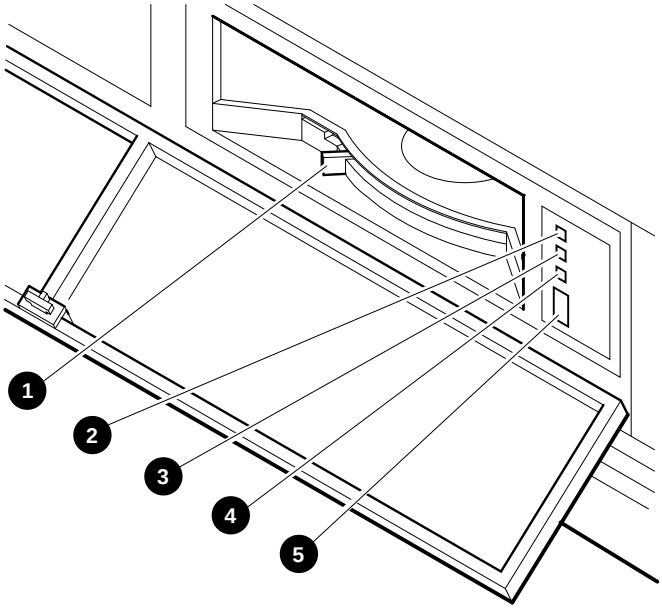
2.2 TZ30 Tape Drive

The TZ30 uses CompacTape™ or CompacTape II cartridges that contain magnetic tape on a single reel. When you insert the tape cartridge into the drive and load it, the tape is automatically threaded onto a take-up reel inside the drive.

2.2.1 TZ30 Controls and LEDs

Figure 2–2 shows the location of the controls and LEDs on the TZ30 tape drive. Table 2–1 explains the functions of the TZ30 controls. Table 2–2 explains the functions of the TZ30 LEDs and beeper.

Figure 2–2 TZ30 Tape Drive Controls and LEDs



❶ Operate Lever

❷ Write-Protect LED (Red)

❸ Tape-in-Use LED (Yellow)

❹ Operate-Lever LED (Green)

❺ Unload Button

Table 2–1 TZ30 Controls

Control	Function
Unload button	The unload button rewinds and disengages the tape from the take-up reel inside the TZ30. The tape must be completely rewound and unloaded into the tape cartridge before you can remove the tape cartridge from the drive. The tape is fully unloaded when the operate lever LED is on.
Operate lever[1]	Use the operate lever to lock or unlock a tape cartridge. To insert a tape cartridge, the operate lever must be in the unlock position. Once you insert a tape cartridge and the green LED is on, move the operate lever to the lock position. To eject the tape cartridge from the drive, (only when the green LED is on or flashing, and after the beeper sounds momentarily), move the operate lever to the unlock position.

[1]When using the operate lever, slide it completely to the lock or unlock position before beginning the next operation.

Table 2–2 TZ30 LEDs

LED	State	Condition
Operate-lever LED	On	Safe to use the operate lever.
	Off	Do not use the operate lever.
	Flashing	The drive has detected a tape cartridge or calibration error.
Tape-in-use LED	Flashing	Tape in use.
	On	Tape loaded and ready to use.
Write-protect LED	On	Tape is write-protected.
	Off	Tape is write-enabled.
All three LEDs	On	The power-up diagnostic test is in progress.
All three LEDs	Flashing	Drive fault.
Beeper	One beep	The TZ30 beeps once when you turn on the system unit.
	Two beeps	Indicate that the tape is unloaded and you can remove it from the drive.

2.2.2 Inserting and Using a Tape Cartridge

To insert a tape cartridge, see Figure 2–3 and follow these steps:

1. Slide the operate lever to the unlock position.
2. Insert the tape cartridge following these rules:
   - If you insert the tape cartridge more than half-way into the drive, you must insert the tape cartridge fully.
   - If you want to use another tape cartridge, insert the tape cartridge fully, unload the tape cartridge, and then remove it.
   - If you cannot insert the tape cartridge into the TZ30, move the operate lever to the lock position. Then move the operate lever to the unlock position and reinsert the tape cartridge.
   - Do not push the tape cartridge into the TZ30 while moving the operate lever between the lock and unlock positions. If you do so, the TZ30 interprets this action as an insertion of the tape cartridge.

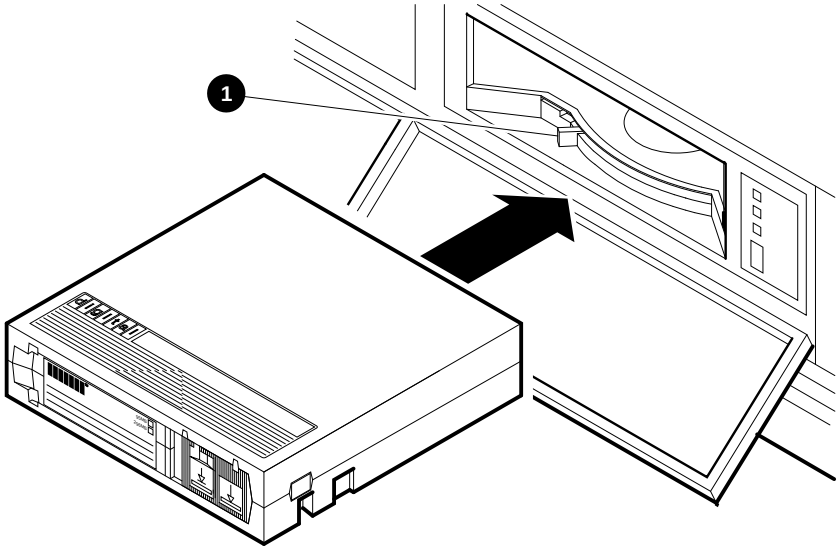
   The green LED turns on.

3. Move the operate lever to the lock position to lock the tape cartridge in the drive.

   The green LED turns off, and the yellow LED starts to flash, indicating that the tape is loading. When you load the tape and it is ready for use, the yellow LED stays on. When the yellow LED stays on and the green LED stays off, the tape is ready to use.

See the *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* manual if errors occur while you are using the TZ30 tape drive.

Figure 2–3 Inserting a Tape Cartridge



❶ Operate Lever

2.2.3 Removing a Tape Cartridge from the Drive

To remove a tape cartridge, follow these steps:

Caution

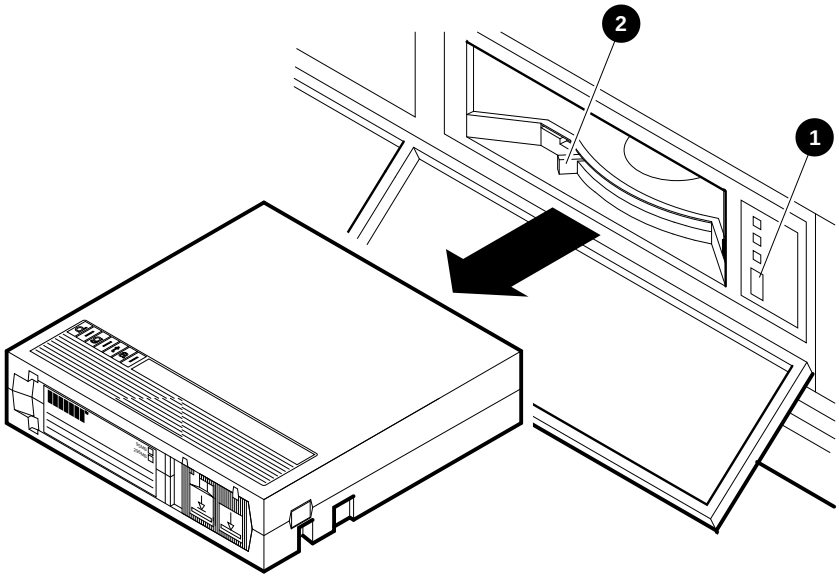
- The tape must fully rewind before you can remove the tape cartridge from the tape drive.
- Remove the tape cartridge from the drive before setting the on/off switch on the system unit to the off (O) position.

1. Press the unload button (see Figure 2–4) or enter the appropriate system software command.

   The yellow LED flashes as the tape rewinds. Once the tape rewinds completely, the beeper sounds twice and the green LED turns on.

2. Move the operate lever to the unlock position.
3. Remove the tape cartridge from the tape drive after it ejects.

Figure 2–4 Removing a Tape Cartridge



❶ Unload Button

❷ Operate Lever

2.3 TZK10/TZK11 QIC Tape Drive

The TZK10/TZK11 QIC tape drives are quarter-inch cartridge, streaming tape drives; both are operated in the same manner. You can use them for archival, data storage and retrieval, and data collection purposes.

2.3.1 TZK10/TZK11 Controls and LEDs

The TZK10/TZK11 QIC tape drive has one dual-color LED (green and amber) and an eject button. Figure 2–5 shows the positions of the LED and the eject button. Table 2–3 lists the functions of the LED and the eject button.

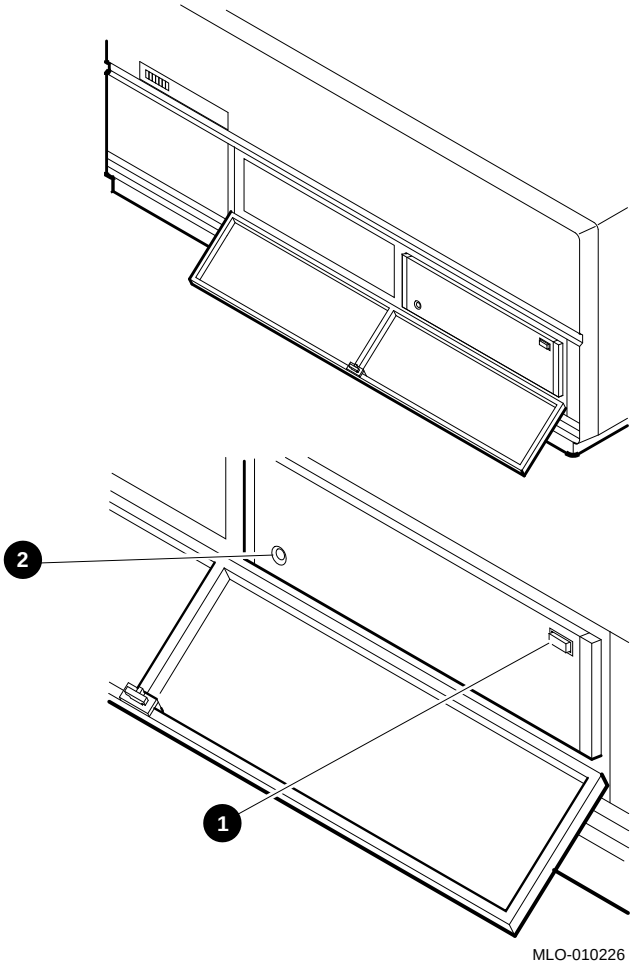
Table 2–3 TZK10/TZK11 Eject Button and LED Functions

Item	State	Function
Eject button		Unlocks the door and partially ejects the QIC tape from the drive.
LED	Off	Tape is not present or the tape is present, but it has been dismounted by the software.
	Stays green	Tape is loaded.
	Flashes green	Tape is in motion.
	Stays amber	A fault has occurred.

2.3.2 QIC Tape

You can use several types of QIC tape with the TZK10/TZK11 QIC tape drives. Appendix B lists the types of tape that you can use. It also includes information on the care and handling of these tapes.

Figure 2–5 TZK10/TZK11 Eject Button and LED



❶ Eject Button

❷ Dual-Color LED

2.3.3 Inserting a QIC Tape into the TZK10/TZK11

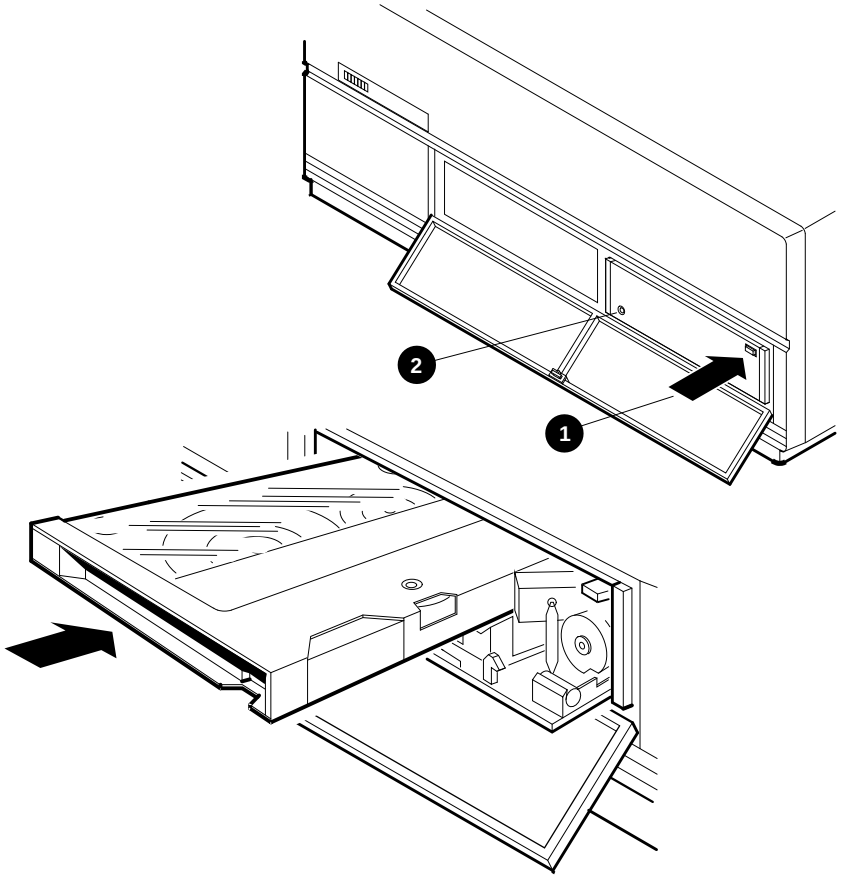
To insert a QIC tape into the TZK10/TZK11, follow these steps:

1. Press the eject button to open the door on the front of the TZK10/TZK11 (see Figure 2–6). The door partially opens.
2. Open the door fully.
3. Insert the QIC tape into the TZK10/TZK11. Figure 2–6 shows the correct orientation of the tape as you insert it. Slide the tape in until you feel resistance.
4. Close the door.

When you insert the tape correctly, the LED turns green, then flashes green while the TZK10/TZK11 makes several whirring sounds. Finally, the sounds stop and the LED stays green. You can now send operating system commands to the TZK10/TZK11 QIC tape drive.

If the LED turns amber, see the *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* manual.

Figure 2–6 Inserting a QIC Tape



❶ Eject Button

❷ Dual-Color LED

2.3.4 Removing a QIC Tape from the TZK10/TZK11

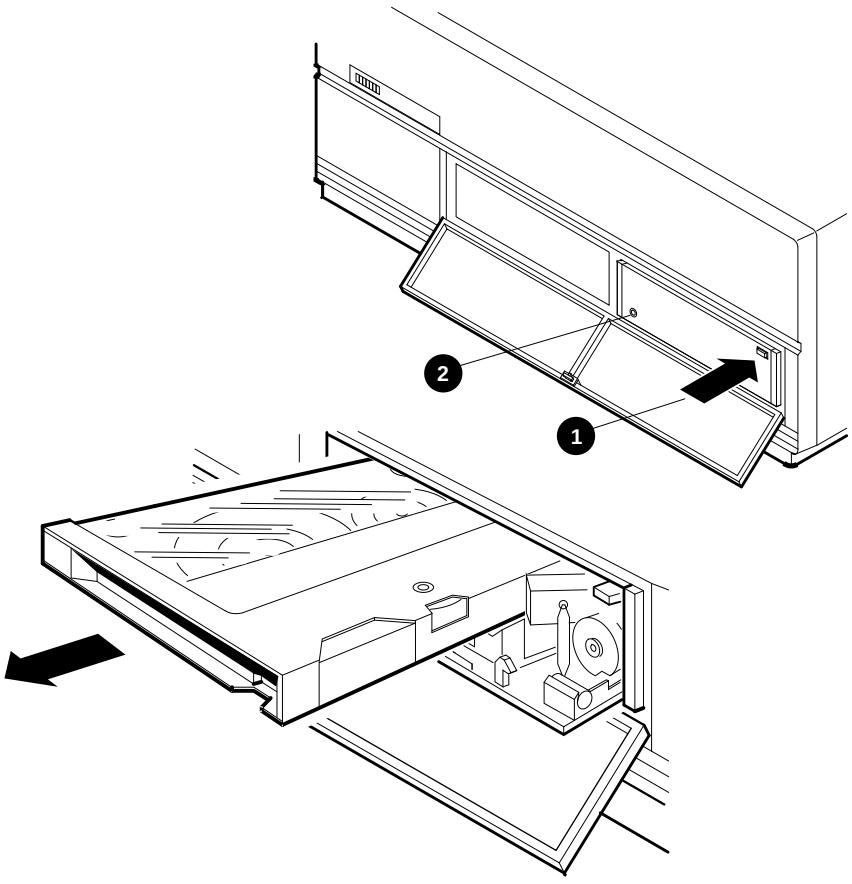
To remove a QIC tape from the TZK10/TZK11, follow these steps:

1. Dismount the QIC tape by entering the commands from the operating system.

   Before you go to step 2, wait until the tape stops moving (the TZK10/TZK11 stops whirring) and the LED stops flashing green and stays green.

2. Press the eject button (see Figure 2–7).
3. Open the door fully and remove the tape.
4. Close the door.

Figure 2–7 Removing a QIC Tape



MLO-010228

❶ Eject Button

❷ Dual-Color LED

2.4 TLZ06/TLZ07 Cassette Tape Drive

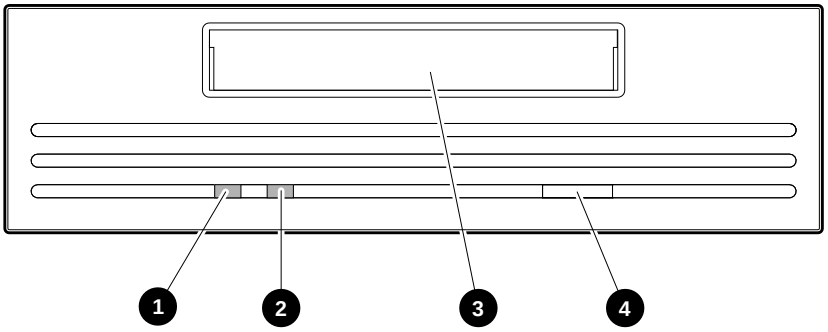
The TLZ06/TLZ07 cassette tape drive is a streaming tape drive that uses 4 millimeter (mm) tape. You can use it for archival, data storage and retrieval, and data collection purposes. The TLZ06/TLZ07 tape drive design incorporates both digital data storage (DDS) and digital audio tape (DAT) technologies.

2.4.1 TLZ06/TLZ07 Controls and LEDs

The TLZ06/TLZ07 cassette tape drive has two LEDs (amber and green) and an unload button. Figure 2–8 shows the positions of the LEDs and the unload button. The unload button ejects the cassette tape from the TLZ06/TLZ07 cassette tape drive. Table 2–4 lists the functions of the LEDs.

Appendix B lists the types of tape that you can use. It also includes information on the care and handling of these tapes.

Figure 2–8 TLZ06/TLZ07 LEDs, Cassette Slot, and Unload Button



❶ Tape/Activity LED

❷ Write-Protect LED

❸ Cassette Slot

❹ Unload Button

Table 2–4 TLZ06/TLZ07 LED Functions

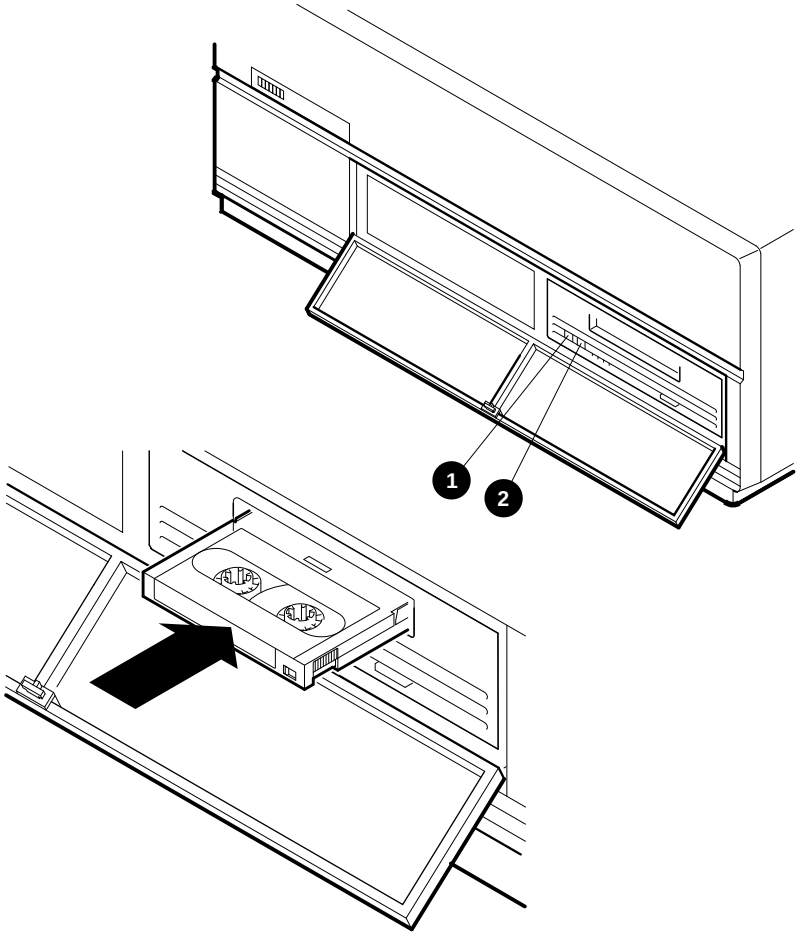
Status	Write-protect LED	Tape/activity LED
No tape loaded	Off	Off
Tape loaded and write enabled	Off	On
Tape loaded and write protected	On	On
No drive activity	Signals the cassette's write-protect status	On
Drive activity	Signals the cassette's write-protect status	Signals the drive activity
Loading a tape	Off at first, then signals the cassette's write-protect status	Flashes dimly, then stays on.
Unloading a tape	Signals the cassette's write-protect status, then goes off	Flashes dimly, then goes off. It then signals the drive activity
Reset sequence	Flashes synchronously with the tape/activity LED, then signals the cassette's write-protect status	Flashes synchronously with the write-protect LED, then signals the drive activity
Power-up tests and self-tests	Flashes, then signals the cassette's write-protect status	Flashes, then signals the drive activity
Extended self-tests	Signals the cassette's write-protect status	Flashes (one to four minutes), then signals the drive activity
Test failures	Flashes	Flashes

2.4.2 Inserting a Cassette Tape into the TLZ06/TLZ07

To insert a cassette tape into the TLZ06/TLZ07, slide the tape in until the TLZ06/TLZ07 draws the tape inside. Figure 2–9 shows the correct orientation of the tape as you insert it.

When you insert the tape correctly, the tape/activity LED flashes dimly and then stays on. You can now send operating system commands to the TLZ06 /TLZ07 cassette tape drive. If both LEDs continue to flash, see the *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* manual.

Figure 2–9 Inserting a Cassette Tape



MLO-009290

❶ Tape/Activity LED

❷ Write-Protect LED

2.4.3 Removing a Cassette Tape from the TLZ06/TLZ07

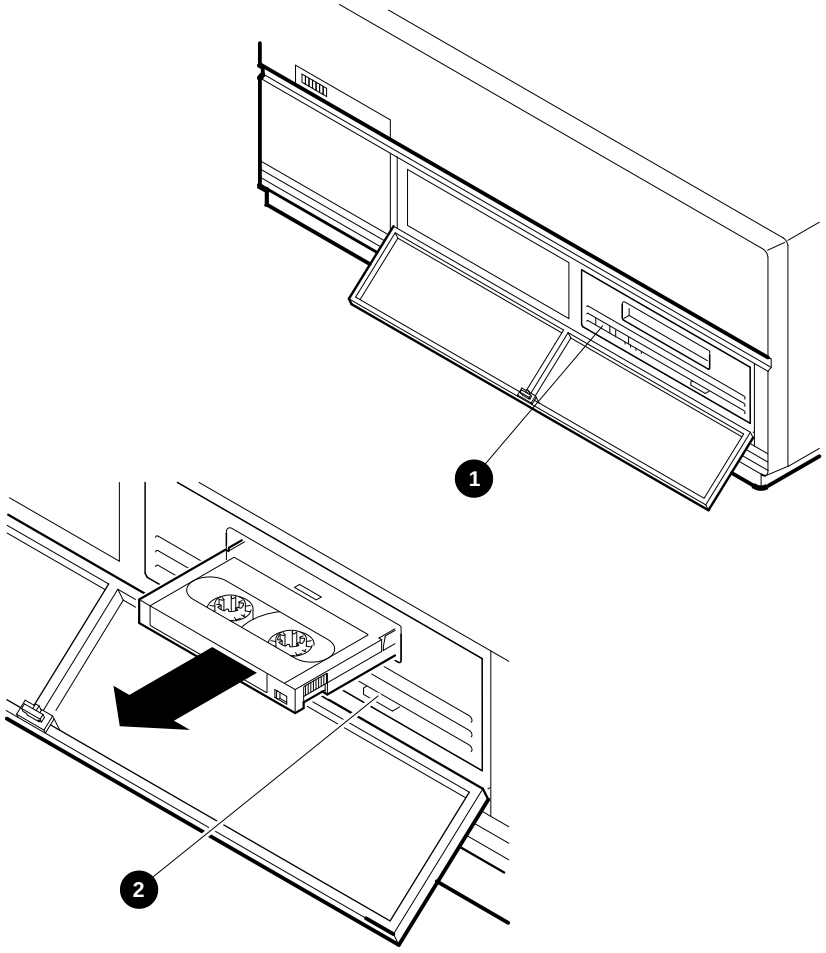
To remove a cassette tape from the TLZ06/TLZ07, follow these steps:

1. Dismount the cassette tape by entering the commands from the operating system.

   Before you go to step 2, wait until the tape/activity LED stops flashing and stays on.

2. Press the tape unload button (see Figure 2–10).
3. Remove the cassette tape.

Figure 2–10 Removing a Cassette Tape



❶ Tape/Activity LED

❷ Tape Unload Button

2.5 RX23/RX26 Diskette Drive

The RX23/RX26 diskette drives allow you to read information from and write information to 3.5 inch removable diskettes. You can use high-density (HD) or extra-density (ED) diskettes.

The RX26 diskette drive can read from and write data to HD diskettes that have been formatted by an RX23 diskette drive. However, the ED diskettes used by the RX26 diskette drive cannot be used by the RX23 diskette drive. Appendix B contains information about both types of diskette.

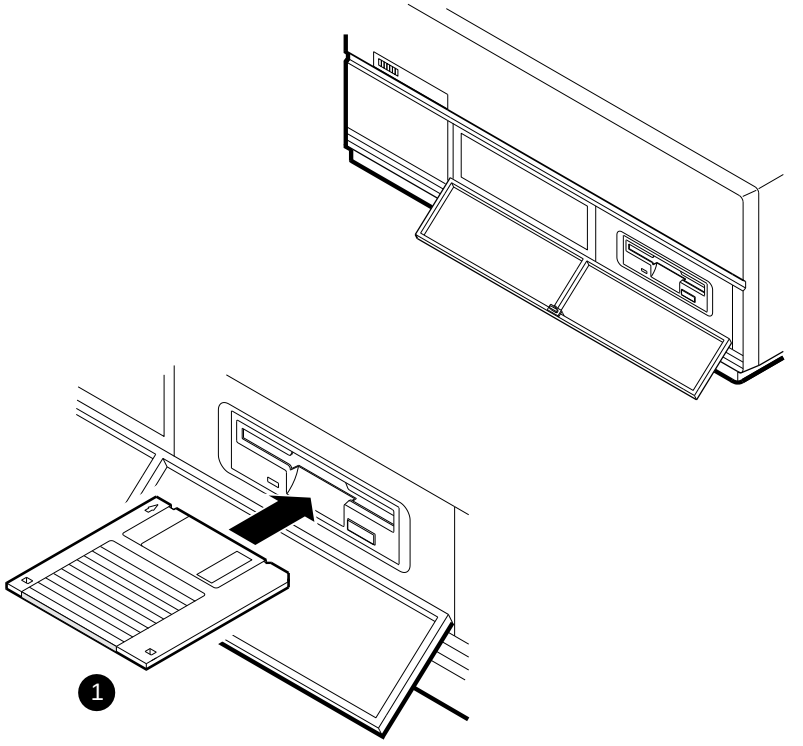
Caution

Never remove a diskette while the diskette drive is performing a function. When the diskette drive is performing a function, the activity LED either stays on or flashes, depending on the function.

2.5.1 Inserting a Diskette

To insert a diskette into the RX23/RX26 diskette drive, slide the diskette into the drive (see Figure 2–11). The diskette slides in and drops down to its load position.

Figure 2–11 Inserting a Diskette



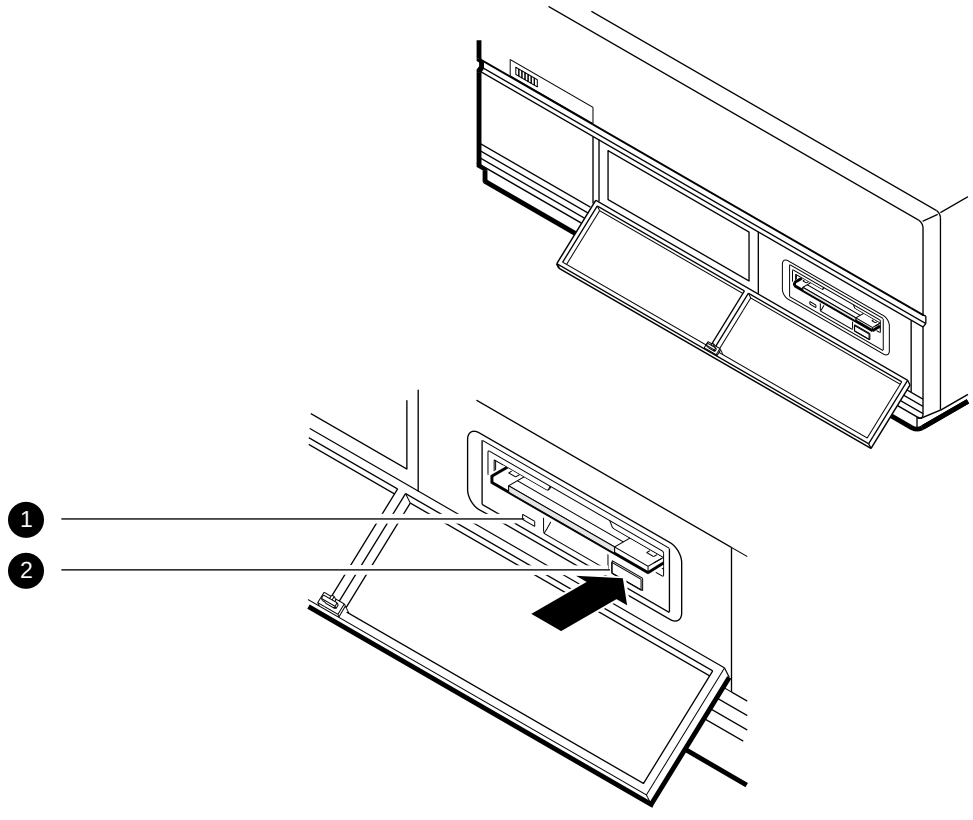
RE_EN06156A_91

❶ Diskette

2.5.2 Removing a Diskette

You must dismount the diskette drive before removing a diskette. For information on dismounting a diskette, see the software documentation.

To remove a diskette from the diskette drive, press the eject button on the front of the diskette drive. Remove the diskette when it extends slightly from the diskette slot.



RE_EN06157A_91

❶ Activity LED

❷ Eject Button

2.6 RRD42 Compact Disc Drive

The RRD42 compact disc drive is a read-only device that can read information from 600MB compact discs. The compact disc fits into a supplied caddy, which you insert into the drive.

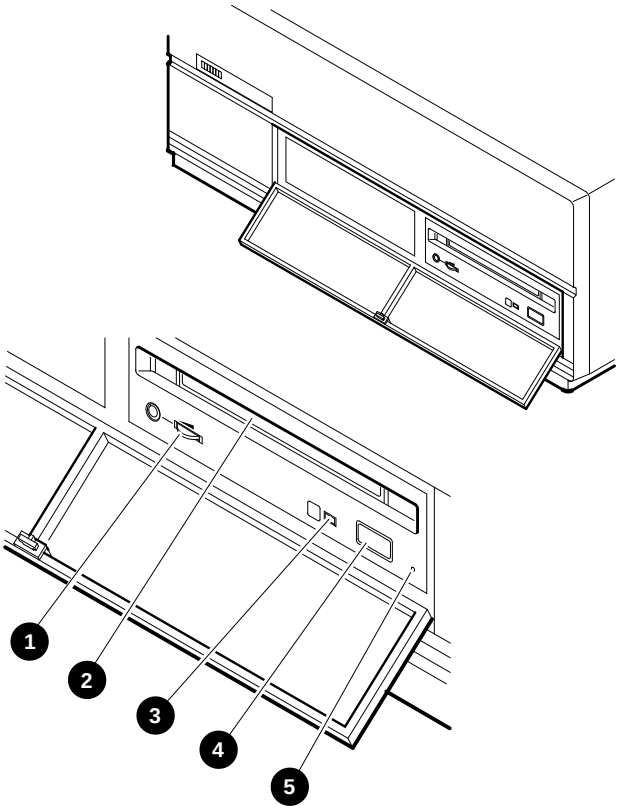
Note

You can order additional caddies from your Digital™ sales representative. The part number is 30-34512-01.

2.6.1 RRD42 Controls and LEDs

The front panel of the RRD42 compact disc drive has a disc slot, an eject button, a busy LED, and an emergency eject hole. Figure 2–12 shows the front panel of the RRD42 compact disc drive.

Figure 2–12 RRD42 Compact Disc Drive Front Panel



❶ Volume control and headphone socket.

❷ Disc slot.

❸ Busy LED—This LED turns on when data is read from the disc. It flashes during seek operations.

❹ Eject button—Press this button to eject the caddy from the RRD42.

❺ Emergency eject hole—Use the emergency eject hole to manually eject the caddy if a power failure occurs (see Section 2.6.3).

2.6.2 Inserting a Compact Disc into the RRD42 Compact Disc Drive

Inserting a compact disc involves two stages:

- Loading the compact disc into the caddy
- Inserting the caddy into the RRD42

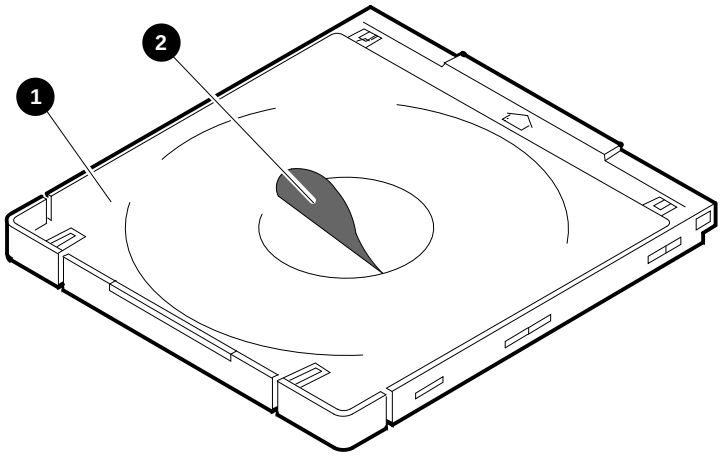
These stages are described in the following subsections.

Loading the Compact Disc into the Caddy

To load the compact disc into the caddy, follow these steps:

1. If there is a protective film on the center of the caddy lid, as shown in Figure 2–13, remove it before using the caddy.

Figure 2–13 Compact Disc Caddy Protective Film



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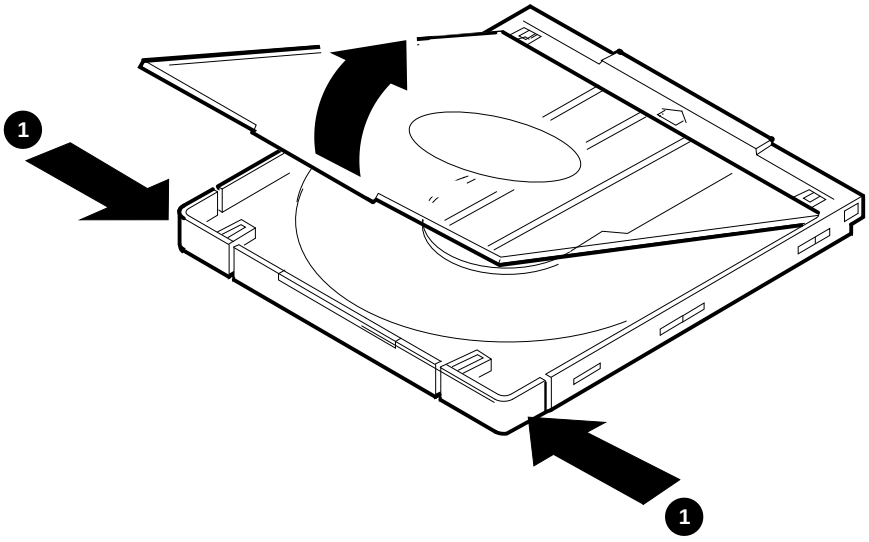
❶ Disc caddy

❷ Protective film

2. Open the lid of the caddy by pressing the tabs on both sides of the caddy, shown in Figure 2–14. These tabs are each marked with an arrowhead and the word *open*.

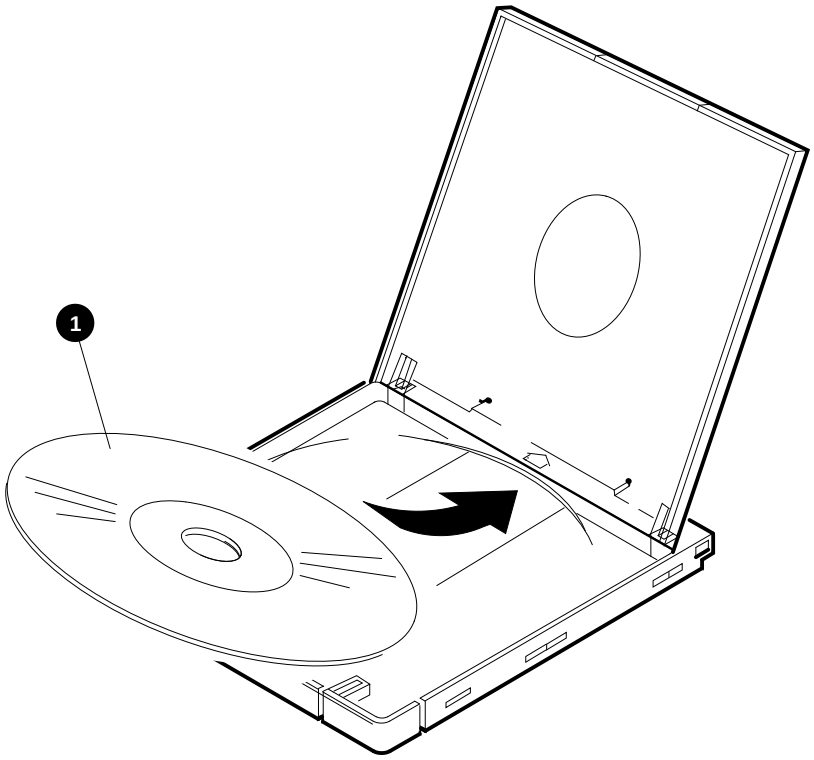
Figure 2–14 Opening Disc Caddy



❶ Tabs

3. Place the compact disc in the caddy, as shown in Figure 2–15. The disc label must face upwards.

Figure 2–15 Inserting Disc into Caddy



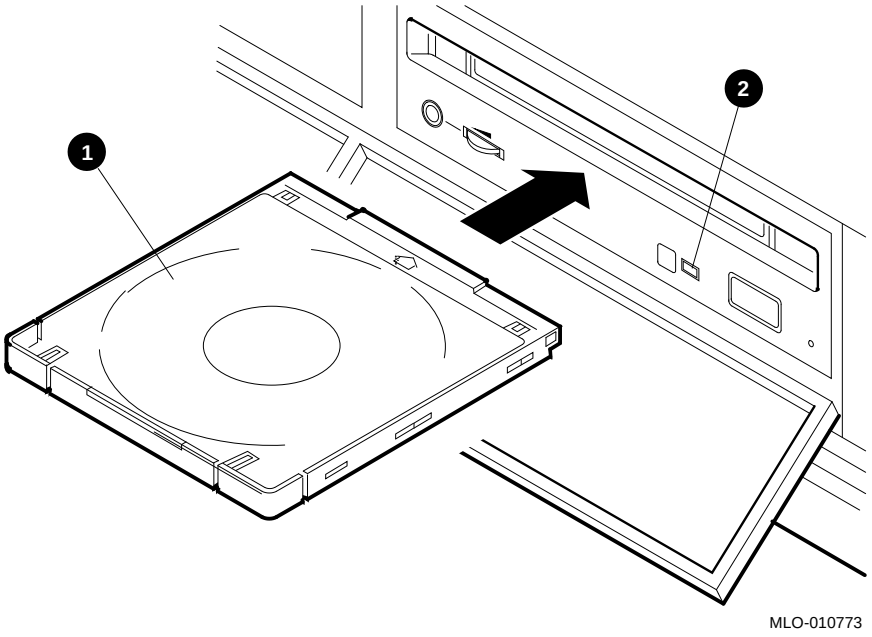
❶ Compact disc

4. Close the lid of the caddy firmly.

Inserting the Caddy into the RRD42

Insert the caddy into the slot on the front of the RRD42 with the disc label facing upwards, as shown in Figure 2–16. Push the caddy until it is completely inserted.

Figure 2–16 Inserting Caddy with Disc into RRD42



❶ Disc and disc caddy

❷ Busy LED

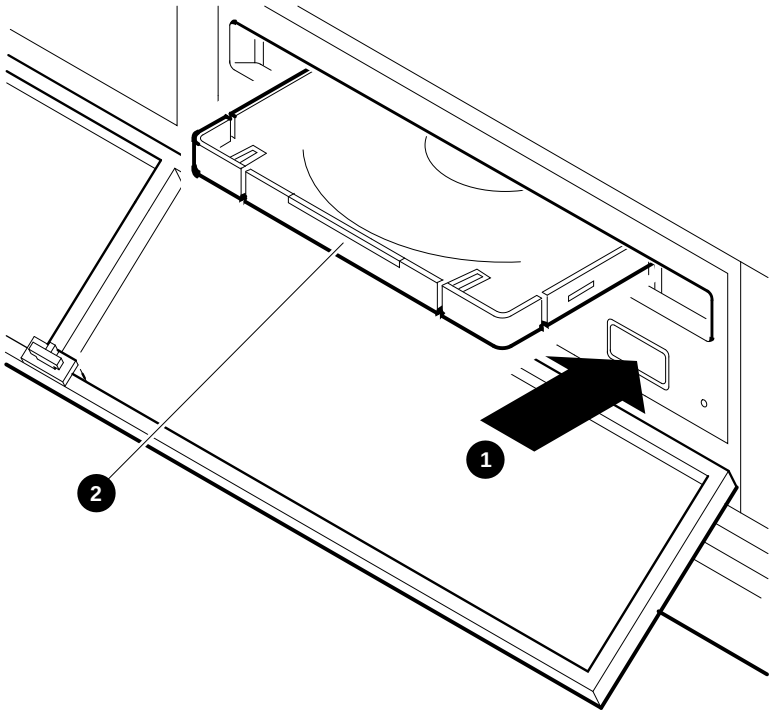
The busy LED then stays on for a few seconds. When the busy LED goes off, the RRD42 can receive commands and you can read data from the compact disc.

The RRD42 ejects the compact disc if the disc is upside-down, not properly inserted in the caddy, or if other conditions prevent it from reading the disc.

2.6.3 Removing the Caddy from the RRD42

Press the eject button on the front, as shown in Figure 2–17 of the RRD42 to remove the caddy.

Figure 2–17 Removing Caddy with Disc from RRD42



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❶ Eject button

❷ Disc and disc caddy

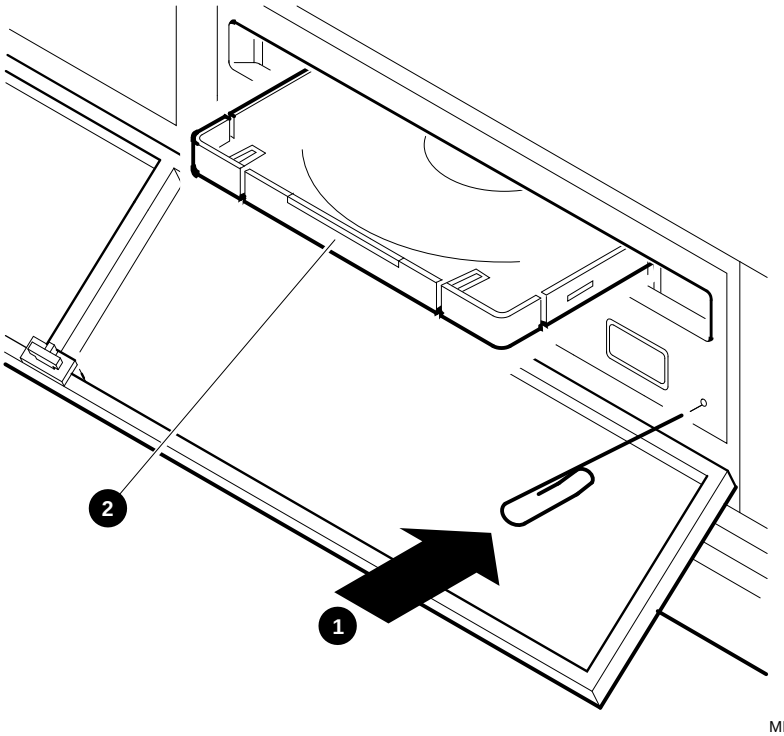
If the eject button is disabled by software, you must manually remove the caddy.

Removing a Caddy Manually

To remove a caddy manually from the RRD42, see Figure 2–18 and follow these steps:

1. Set the on/off switch on the system unit to the off (O) position.
2. Insert a straightened large paper clip or metal rod, 1.2 millimeters (mm) (0.047 inches) in diameter and not less than 35 mm (1.38 in.) long, into the emergency eject hole and push the clip or rod in until the caddy rises.
3. Push the clip or rod hard until the caddy emerges from the slot.

Figure 2–18 Removing Caddy Manually



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❶ Paper clip—Insert the clip 35 mm into the emergency eject hole.

❷ Disc and disc caddy

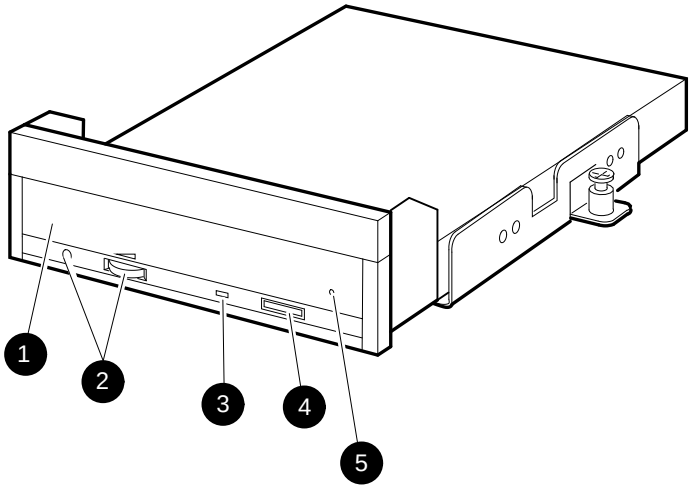
2.7 RRD43 Compact Disc Drive

The RRD43 compact disc drive is a read-only device that can read information from industry standard 600MB compact discs. The compact disc is inserted directly into the drive.

2.7.1 RRD43 Controls and LEDs

The front panel of the RRD43 compact disc drive contains the disc tray and has an eject button, a busy LED, and an emergency eject hole. Figure 2–19 shows the front panel of the RRD43 compact disc drive.

Figure 2–19 RRD43 Compact Disc Drive Front Panel



MLO-012261

❶ Disc tray.

❷ Volume control and headphone socket.

❸ Busy LED—This LED turns on when data is read from the disc. It flashes during seek operations.

❹ Eject button—Press this button to eject the disc tray from the RRD43.

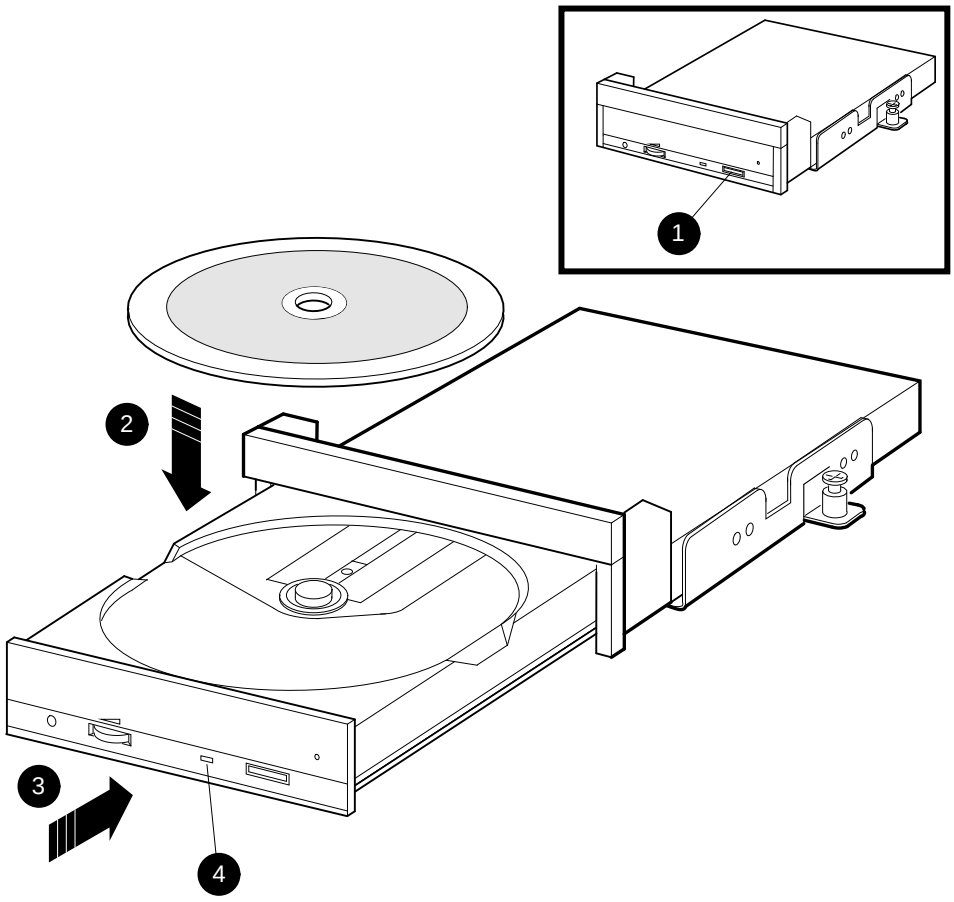
❺ Emergency eject hole—Use the emergency eject hole to manually eject the disc tray if a power failure occurs (see Section 2.7.3).

2.7.2 Inserting a Compact Disc into the RRD43 Compact Disc Drive

To insert a disc in the RRD43, see Figure 2–20 and follow these steps.

1. Push the eject button inward to release the disc tray. The tray will eject part way out; pull the tray out manually to its full extention.
2. Pick up the disc by the edges; taking care not to touch the bottom (unlabelled) side of the disc with any part of your hand or fingers.
3. Insert the disc into the tray with the disc label facing upwards.
4. Push the disk tray back into the RRD43 until it is completely inserted and latched.
5. The busy LED stays on for a few seconds. When the busy LED goes off, the RRD43 can receive commands and you can read data from the compact disc.

Figure 2–20 Inserting a Disc in the RRD43



❶ Eject button

❷ Disc (hold by the side edge and set into place in the disc tray)

❸ Disc tray (push in)

❹ Busy LED

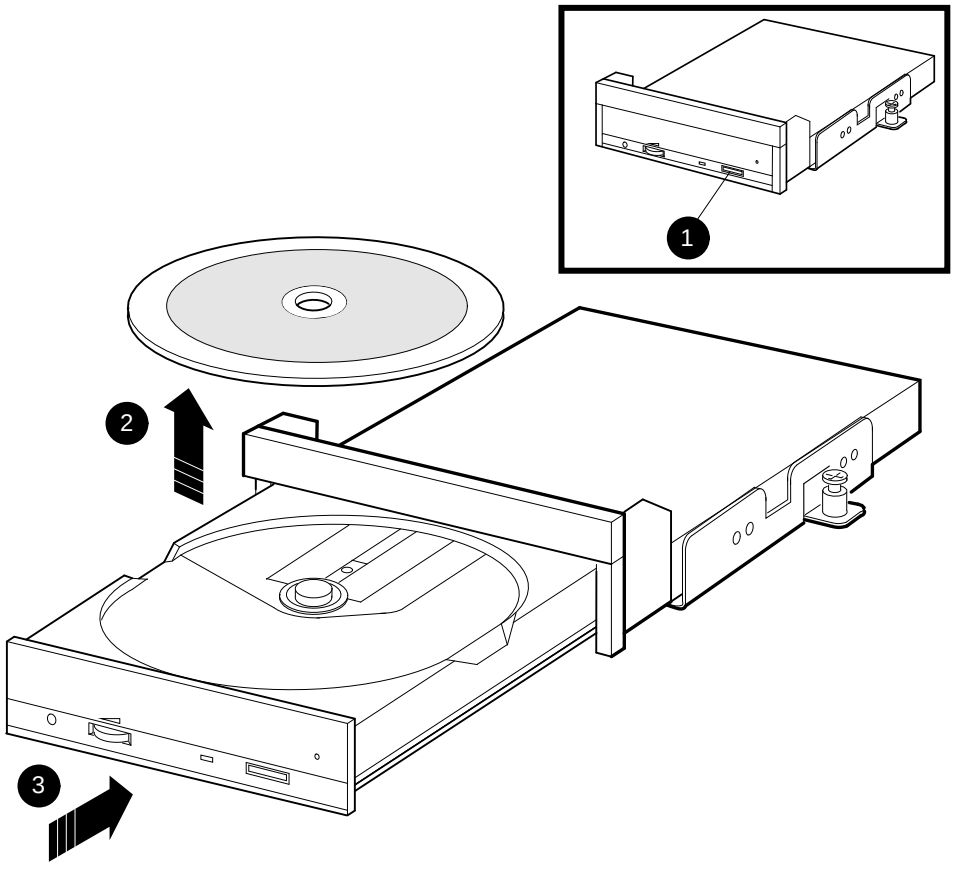
If the disc is upside-down, not properly inserted in the tray, or if other conditions prevent the RRD43 from reading the disc, the busy LED will blink, then stay on steadily.

2.7.3 Removing the Disc from the RRD43

To remove a disc from the RRD43, see Figure 2–21 and follow these steps.

1. Push the eject button inward to release the disc tray. The tray will eject part way out; pull the tray out manually to its full extention.
2. Remove the disc from the tray; pick up the disc by the edges, taking care not to touch the bottom (unlabelled) side of the disc with any part of your hand or fingers.
3. Push the disk tray back into the RRD43 until it is completely inserted and latched.

Figure 2–21 Removing a Disc from the RRD43



❶ Eject Button

❷ Disc (hold by the side edge and remove from the disc tray)

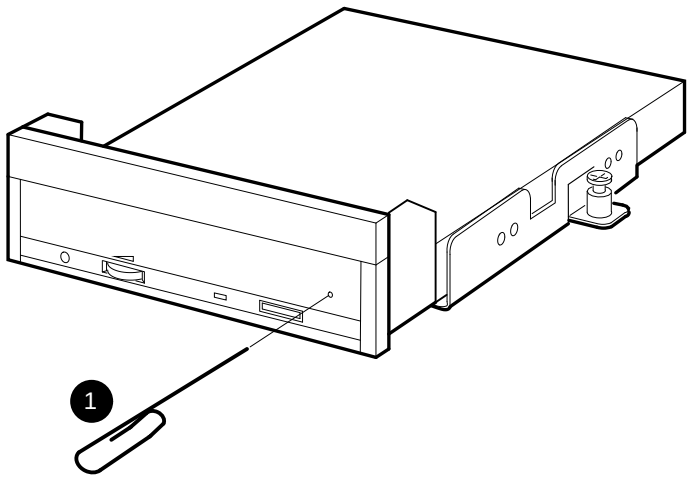
❸ Disc tray (push in)

Removing a Disk Manually

To remove a disc manually from the RRD43, in the event of a power failure for example, see Figure 2–22 and follow these steps:

1. Set the on/off switch on the system unit to the off (O) position.
2. Insert a straightened large paper clip or metal rod, 1.2 millimeters (mm) (0.047 inches) in diameter and not less than 35 mm (1.38 in.) long, into the emergency eject hole and push the clip or rod in until the disc tray disengages.
3. Pull the tray out fully, and remove the disc with your hand.

Figure 2–22 Removing a Disc Manually



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❶ Paper Clip—Insert the clip 35 mm into the emergency eject hole.

2.8 Cleaning Device Drive Heads

This section describes the cleaning recommendations for the drive heads of the following devices:

- TZ30 tape drive
- TZK10/TZK11 QIC tape drives
- TLZ06/TLZ07 cassette tape drive

The heads are the components of the drives that read data from and write data to the media. Digital recommends that, when cleaning the heads, you use the following Digital-supplied cleaning kits:

- TZ30—Use the TKXX-HC head cleaning kit.
- TZK10/TZK11—Use the TZK1X-HA head cleaning kit.
- TLZ06/TLZ07—Use the TLZ04-HA head cleaning kit.

To clean the heads, follow the instructions supplied with the cleaning kit.

Digital recommends that you clean the heads of the TZ30 and TZK10/TZK11 drives after approximately 8 hours of use. Digital recommends that you clean the heads of the TLZ06/TLZ07 drive every two weeks, or after 50 hours of use. You should also clean the drive heads if you encounter problems reading or writing data. The following factors affect the cleaning interval:

- Frequency of use
- Quality of the tape
- Quality of the environment

2.9 System Disk

The system unit contains at least one hard disk. You cannot physically access the hard disk. This hard disk, called the system disk, holds the factory installed software (FIS). FIS is a VMS™ operating system, which is installed before the system is shipped. You can use an operating system stored in a different location if you prefer, but VMS version 5.5-2H4 or later is mandatory. See the *VMS Factory Installed Software User Guide* for more information on using VMS FIS.

3
Network Information

This chapter describes how to connect the system unit to a network and how to disconnect it from a network. It includes information on the following tasks:

- Selecting the Ethernet type
- Connecting the system unit to a ThinWire Ethernet network
- Connecting the system unit to a standard Ethernet network
- Connecting the system unit to a DECconnect™ faceplate
- Testing the Ethernet installation
- Completing the Ethernet installation
- Removing the system unit from a network

This chapter may contain some terms that are unfamiliar to you. These terms are defined in the glossary.

If you have never connected a computer to an Ethernet network, you may need help from a system manager or a network coordinator. If a system manager or network coordinator is not available, contact your Digital services representative.

Caution

Disconnecting Ethernet cables and terminators from the T-connectors on active Ethernet networks disrupts local network communications.

Note

Illustrations in this manual show the VAX 4000 Model 106A system rather than the Model 105A system unless otherwise noted.

3.1 Selecting the Ethernet Type

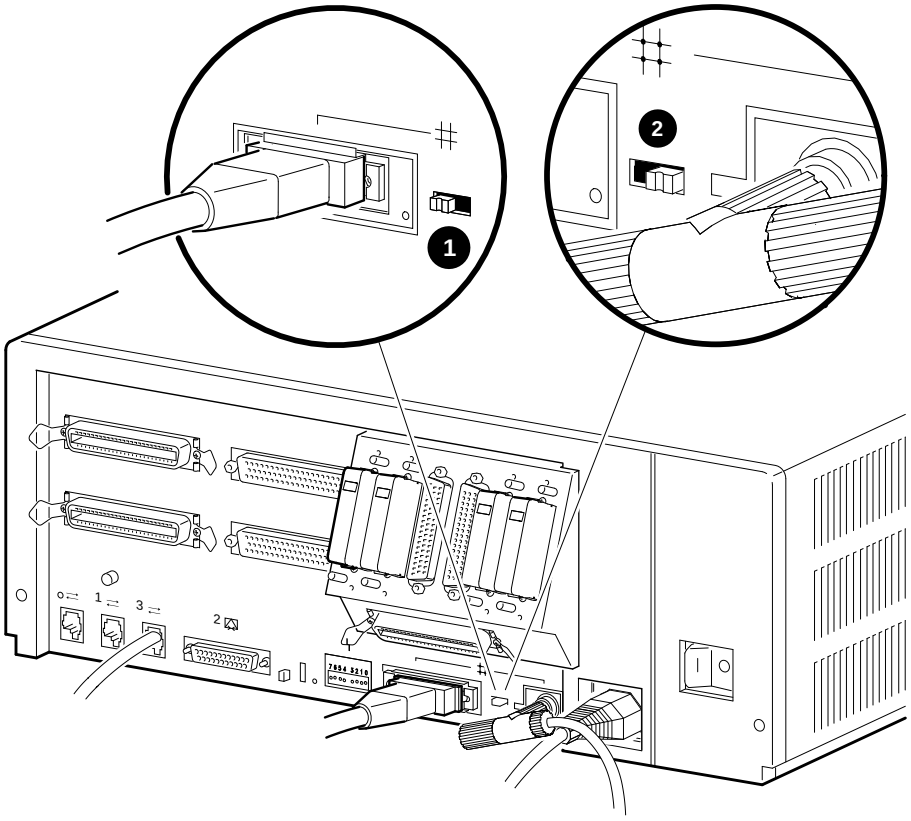
You can connect the system unit to either a ThinWire Ethernet or a standard Ethernet network. Before starting to connect the system unit to the network, ask the network coordinator to tell you which network type to use with the system.

The system unit has a network select switch that you must set depending on which Ethernet type you want to use. When you know which Ethernet type you want to use, set the network select switch as follows:

1. Set the system unit on/off switch to the off (O) position.
2. Set the network select switch to the correct position:
   - If you are using ThinWire Ethernet, slide the network select switch to the right-hand position (see Figure 3–1).
   - If you are using standard Ethernet, slide the network select switch to the left-hand position (see Figure 3–1).

Go to Section 3.4 if you are connecting the system to a standard Ethernet network.

Figure 3–1 Network Select Switch Positions



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❶ Standard Ethernet Switch Position

❷ ThinWire Ethernet Switch Position

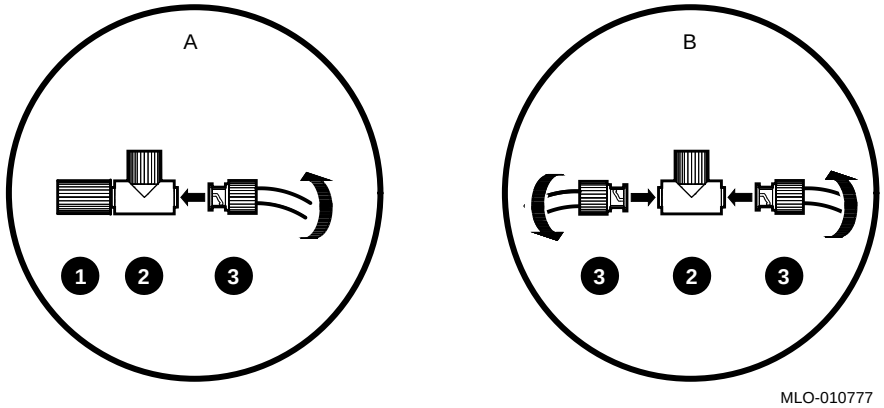
Note: For graphic clarity, the SCSI terminator is not shown.

3.2 Connecting the System Unit to a ThinWire Ethernet Network

To connect the system unit to a ThinWire Ethernet cable, follow these steps:

1. If the ThinWire Ethernet cable is already assembled, remove the ThinWire Ethernet T-connector and terminators from the system and connect the cable (see Figure 3–3). Go to Section 3.5 if you are not connecting the system to a DECconnect faceplate.
2. If the system unit is the first or last system on the ThinWire Ethernet cable, remove one terminator from the T-connector on the back of the system unit. If the system unit is not the first or last system on the ThinWire Ethernet cable, remove both terminators.
3. Attach the ThinWire Ethernet cable to one side of the T-connector if you are connecting the system to the end of the ThinWire Ethernet cable (see Figure 3–2 A). Attach the ThinWire Ethernet cables to both sides of the T-connector if you are connecting the system to the middle of the ThinWire Ethernet cable (Figure 3–2 B).

Figure 3–2 Connecting the ThinWire Ethernet Cable to the T-Connector



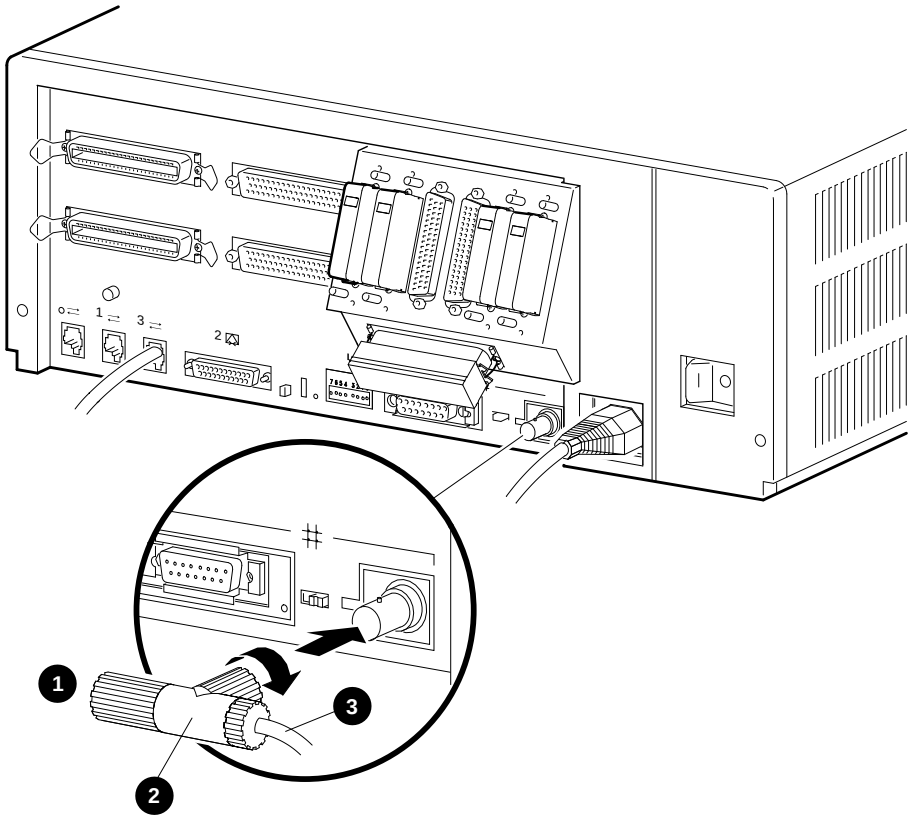
❶ Terminator

❷ T-Connector

❸ ThinWire Ethernet Cable Connector

Go to Section 3.5 if you are not connecting the system to a DECconnect faceplate.

Figure 3–3 Connecting the ThinWire Ethernet Cable to the System Unit



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❶ Terminator

❷ T-Connector

❸ ThinWire Ethernet Cable

3.3 Connecting the System Unit to a DECconnect Faceplate

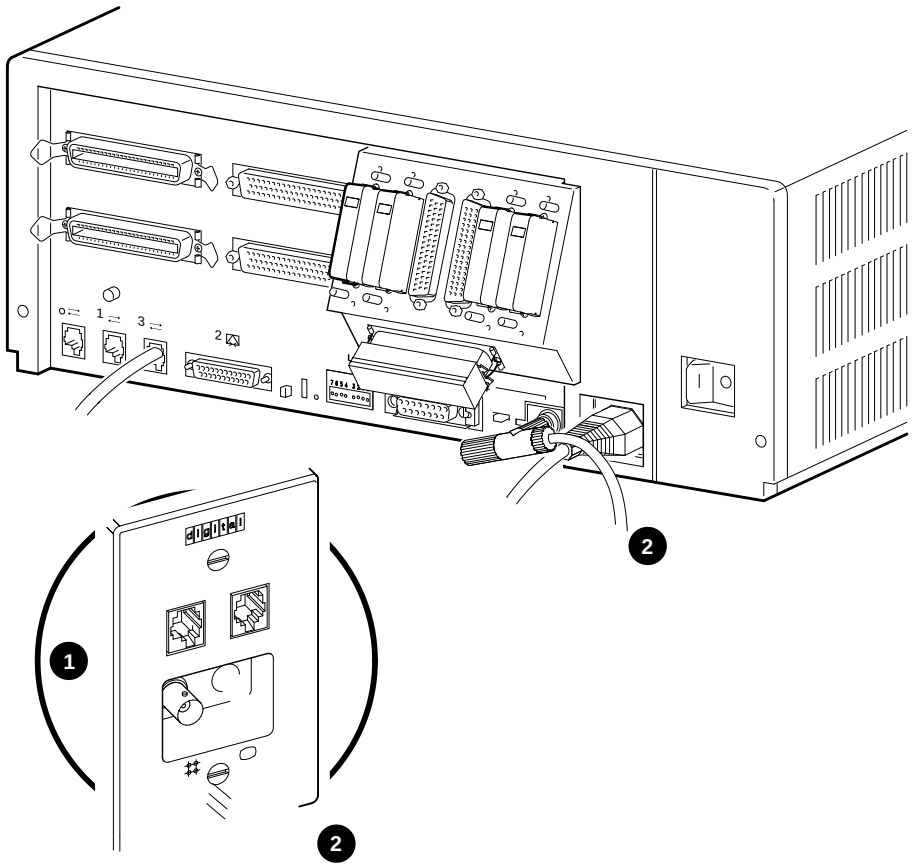
If DECconnect products are installed, a DECconnect faceplate may be on the wall. You can connect VAX systems to DECconnect faceplates using different methods. You can connect either a single VAX system or connect several VAX systems in series. Ask the network coordinator for advice on how to connect the system to the DECconnect faceplate.

If you want to connect only one system to the faceplate, see Figure 3–4 and follow these steps:

1. Remove the ThinWire Ethernet terminator from one side of the T-connector.
2. Attach the ThinWire Ethernet cable to one side of the T-connector.
3. Attach the other end of the ThinWire Ethernet cable to the DECconnect faceplate.

Go to Section 3.5 for information on how to test the network installation.

Figure 3–4 Connecting the System Unit to a DECconnect Faceplate



❶ DECconnect Faceplate

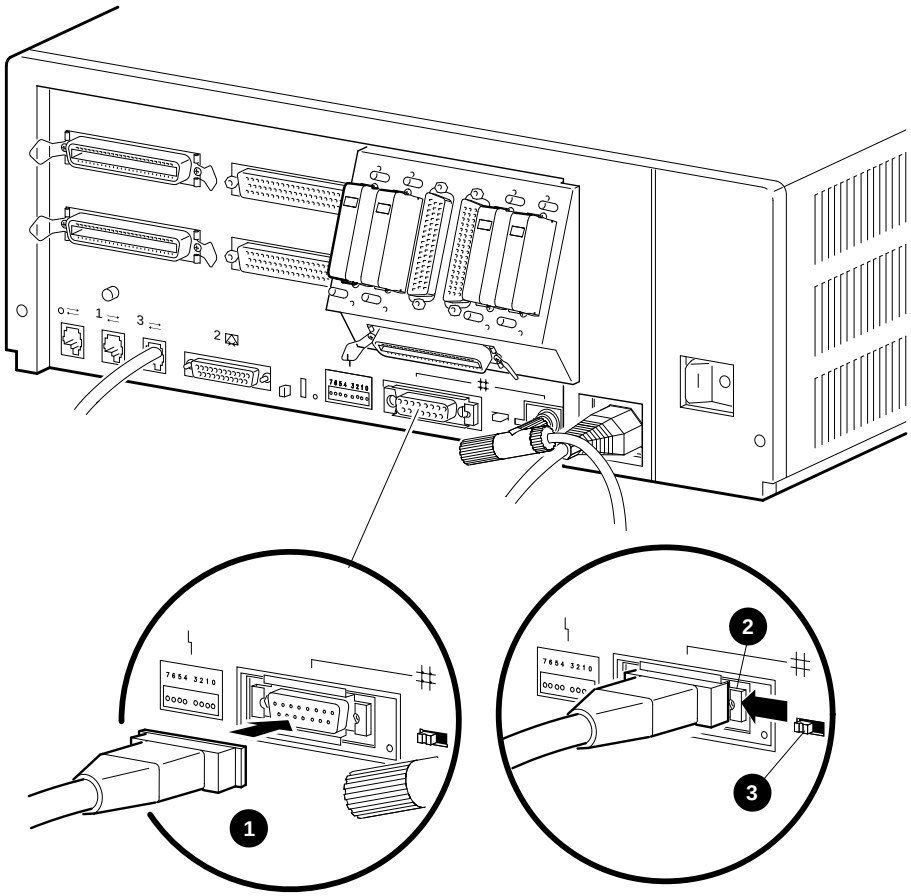
❷ ThinWire Ethernet Cable

3.4 Connecting the System Unit to a Standard Ethernet Network

To connect the system unit to a standard Ethernet network, follow these steps:

1. Attach the 15-pin connector on the standard Ethernet transceiver cable to the back of the system unit. See Figure 3–5.
2. Move the sliding lock on the standard Ethernet connector to the left, securing the standard Ethernet connection.
3. Set the Network Select Switch to the correct position. See Section 3.1.

Figure 3–5 Connecting a Transceiver Cable to the System Unit



MLO-011855

❶ Standard Ethernet Transceiver Cable

❷ Sliding Lock

❸ Network Select Switch

Note: For graphic clarity, the SCSI terminator is not shown.

3.5 Testing the Ethernet Installation

When you complete the network installation procedure, follow these steps to test the installation:

1. Set the system unit on/off switch to the on (|) position.
2. Enter the following command to test the installation:

Run test 5F with the first parameter set to 0 (default) to test the SGEC chip using internal loopback mode. An example of success is shown by the console prompt returning without any messages as shown in the next two examples.

```
>>>T 5F
>>>
```

Another example of test success is shown with test 5F first parameter set to 1 to test the SGEC chip using external loopback mode. This requires a terminator on the selected ethernet port, either thin wire or thick wire. If the test is run while connected to an active net, it may fail.

```
>>>T 5F
>>>
```

If the device fails the self-test, the system responds with a display similar to the following:

```
>>>T 5F
? Test_Subtest_5F_18  Loop_Subtest=0E  Err_Type=FF   DE_SGEC.lis
Vec=010C  Prev_Errs=0000   P1=00000001   P2=00000000   P3=827DFF03  P4=00000000
P5=00000000  P6=00000000   P7=00000000   P8=00000001   P9=00000000 P10=00000000
r0=00000054  r1=000082E2   r2=00000001   r3=000082FA   r4=00008230  r5=00000040
r6=000082E2  r7=20008000   r8=00008000   r9=20140758  r10=13000001 r11=2014044B
 EPC=2005721A dser=0000 cesr=00000000 icsr=01 pcsts=F800 pcctl=FC13
 cctl=00000007 bcetsts=03A0 bcedsts=0400 cefsts=00019200 nests=00
 mmcdsr=00C6C600 mesr=00006000
>>>
```

If the device fails, see the *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* manual.

3.6 Completing the Ethernet Installation

The network coordinator must complete the installation. You must give the following information to the network coordinator:

- A unique node name comprised of a maximum of six alphanumeric characters

  Choose any node name and ask the network coordinator to make sure that the node name is unique on the network.

- The system's Ethernet address

  To determine the system's Ethernet address, follow these steps:

  1. Enter the following command at the console prompt:

     ```
     >>> SHOW ETHERNET
     ```

     The system displays a response similar to the following:

     ```
     ETHERNET = 08-00-2B-1A-0B-BB
     ```

     The alphanumeric string, shown in the form *nn-nn-nn-nn-nn-nn*, is the Ethernet address.

  2. Write down the Ethernet address and give it to the network coordinator.

3.6.1 If the Network Installation Fails

If the network installation fails, contact your Digital Services representative.

3.7 Removing the System Unit from a Network

The following subsections describe how to remove the system unit from a network.

Note

Before removing the system unit from a network:

- Get the approval of the network coordinator.
- See the operating system documentation for information on the shutdown procedures before stopping or turning off the system.
- If the system is the server in a network, do not turn off, halt or restart the system without notifying the other network members.

3.7.1 Removing the System Unit from a ThinWire Ethernet Cable

To remove the system unit from a ThinWire Ethernet cable, follow these steps:

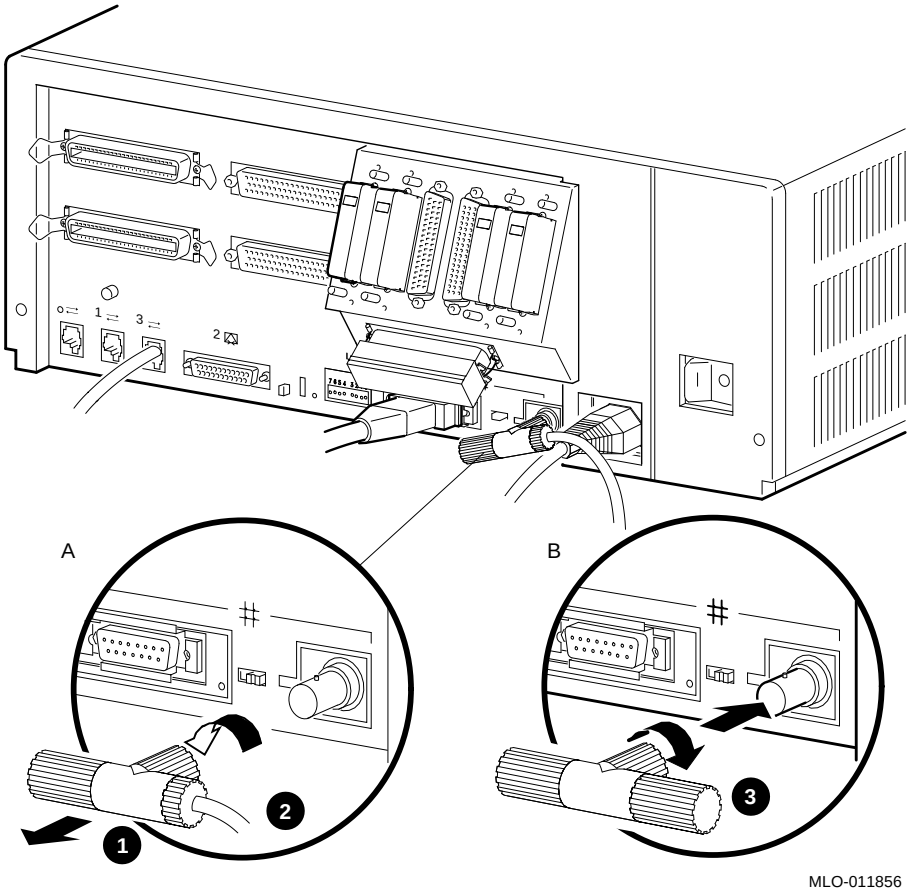
1. Set the on/off switch on the back of the system unit to the off (O) position.

Caution

Disconnecting the ThinWire Ethernet terminator or the ThinWire Ethernet cable connectors from the T-connector may cause disruptions to network communications.

2. Disconnect the center of the T-connector from the ThinWire Ethernet connector on the back of the system unit. See Figure 3–6, A.
3. Add the terminator to the T-connector and reinstall the T-connector. See Figure 3–6, B.

Figure 3–6 Disconnecting a ThinWire Ethernet Cable from the System Unit



❶ T-Connector

❷ ThinWire Ethernet Cable

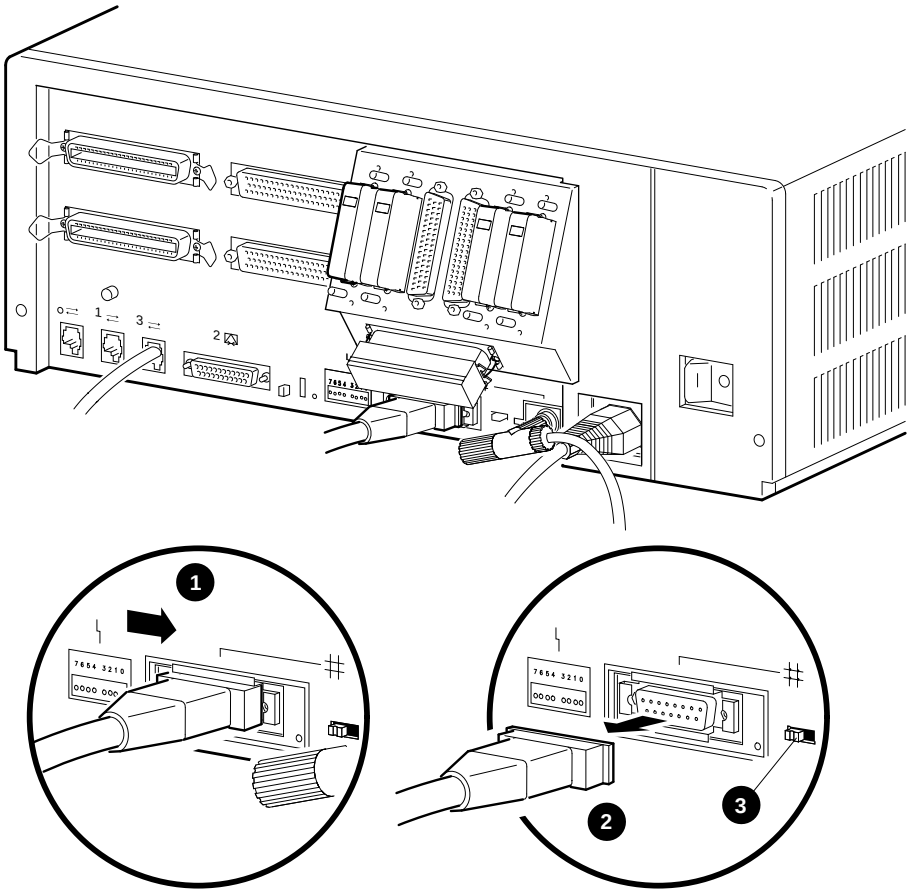
❸ Terminator added

3.7.2 Removing the System Unit from a Standard Ethernet Transceiver Cable

To remove the system unit from a standard Ethernet transceiver cable, follow these steps:

1. Set the on/off switch on the back of the system unit to the off (O) position.
2. Push the sliding lock to the right (see Figure 3–7).
3. Disconnect the transceiver cable from the standard Ethernet connector on the back of the system unit (see Figure 3–7).

Figure 3–7 Disconnecting a Transceiver Cable from the System Unit



❶ Sliding Lock

❷ Standard Ethernet Transceiver Cable

❸ Network Select Switch

3.8 Connecting Systems Into a DSSI VAXcluster Configuration

Note

A DSSI VAXcluster configuration is supported only under VMS Version 5.5-1HN or later.

A DSSI VAXcluster configuration consists of two or more systems configured as a DSSI VAXcluster and sharing their DSSI devices through a Digital Storage System Interconnect (DSSI) bus. See Figure 3–8 and Figure 3–10 for connections. Each system can have direct access to any of the devices on the DSSI bus, including a shared system disk.

The simplest DSSI VAXcluster configuration, a two-system configuration, can let one system disk be used as the system disk for both systems. Although the system disk resides in one system, both systems have equal access to it and to any other DSSI storage device in either system.

A DSSI device, such as the RF35, has a built-in DSSI VAXcluster capability that can dynamically serve two or more systems. DSSI adapters, embedded in the system CPU, let you extend a DSSI bus by connecting it to another system.

Using an external DSSI cable, DSSI-based systems can be connected to form a DSSI VAXcluster configuration.

The benefits of a DSSI VAXcluster configuration:

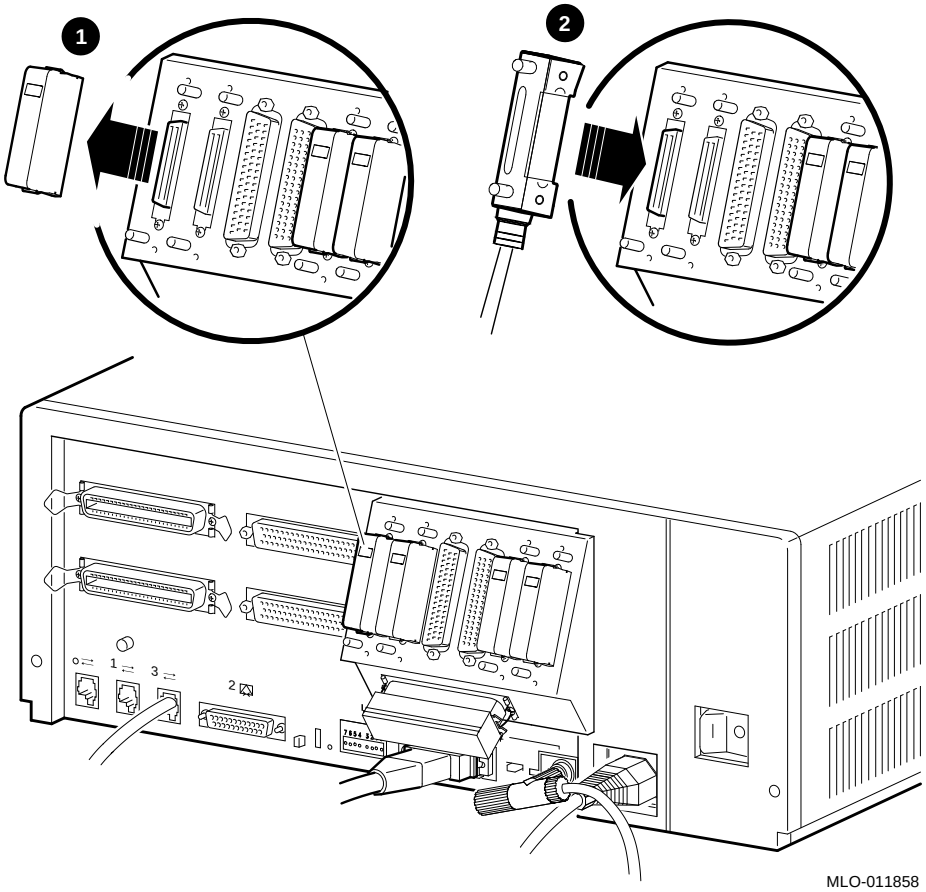
- VAXcluster features such as shared data across systems and satellite nodes are available to you.
- Higher system availability — If one of the systems is unavailable due to a system malfunction, the satellites booted through it can continue operating through the other system.

If one system fails, all satellite nodes booted through that system lose connections to the system disk. Each satellite knows that the system disk is available through a second path. The satellite nodes establish a new connection through the other system and continue operation.

To increase system availability, a second system disk can be added to each boot node. If one system disk fails, the other system disk continues to serve one system and the satellite nodes booted through it. As in any VAXcluster, a second system disk improves availability but increases system management tasks.

Figure 3–8 shows how to attach a DSSI cable to a DSSI port on a VAX 4000 Model 106A system, and Figure 3–9 shows a VAX 4000 Model 105A system. DSSI cables may be attached to any of the DSSI ports in the same way. Figure 3–10 shows a typical DSSI connection between a VAX 4000 Model 105A/106A system and another VAX 4000 system.

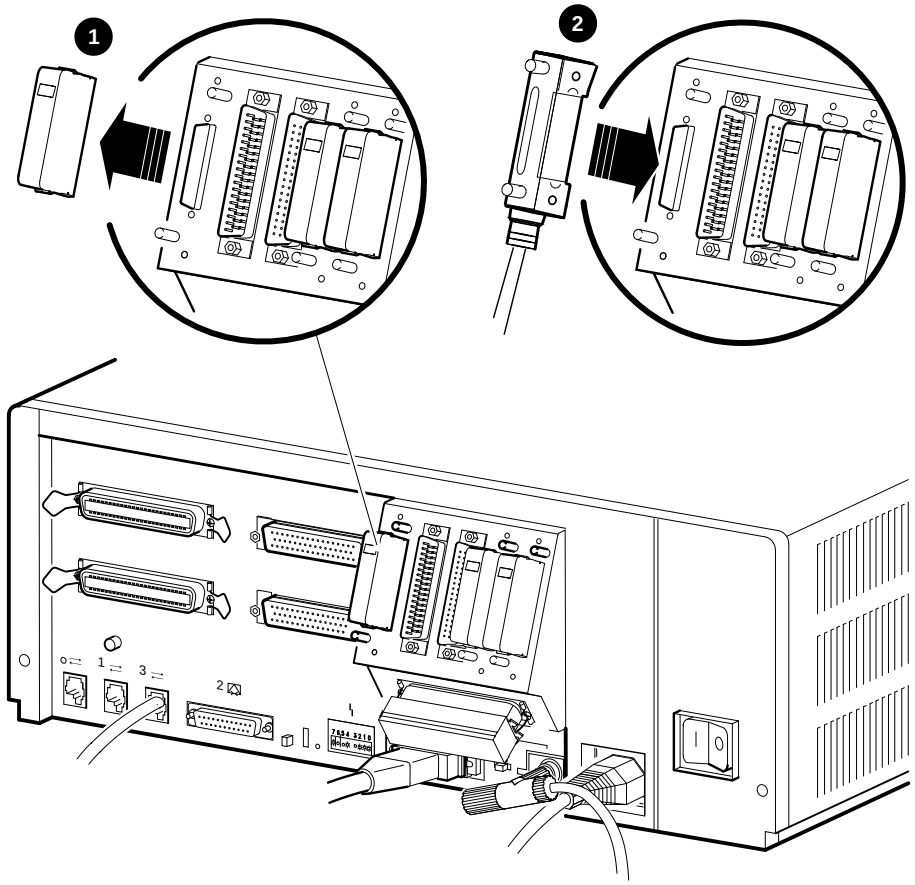
Figure 3–8 Connecting a DSSI Cable to a VAX 4000 Model 106A System



❶ Remove the DSSI terminator.

❷ Insert the DSSI cable and tighten the two screws.

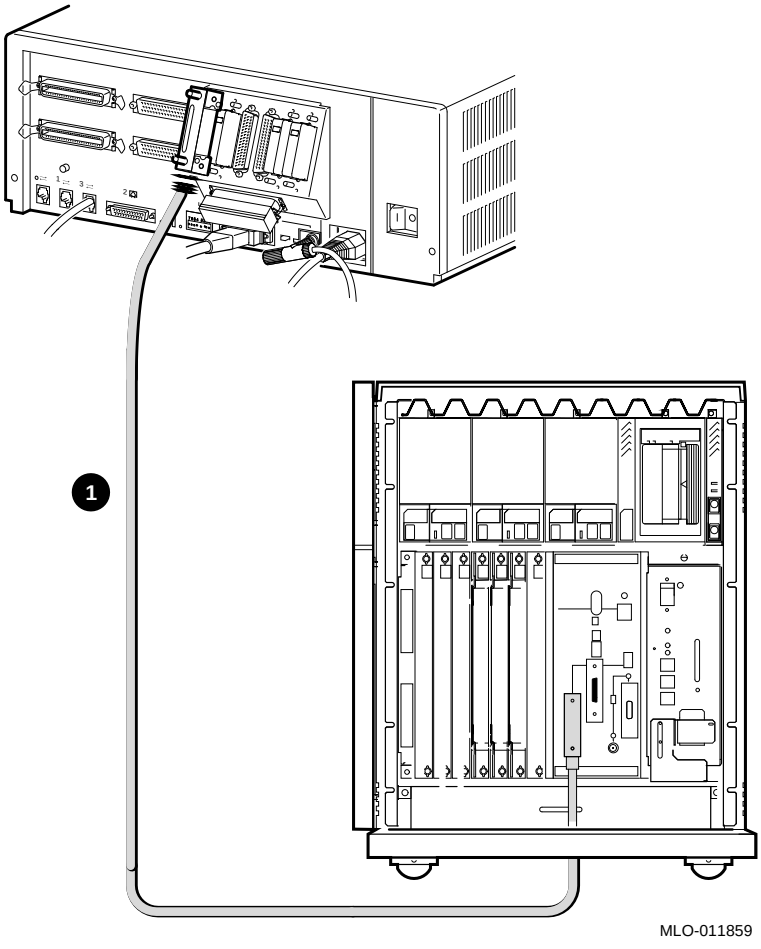
Figure 3–9 Connecting a DSSI Cable to a VAX 4000 Model 105A System



❶ Remove the DSSI terminator.

❷ Insert the DSSI cable and tighten the two screws.

Figure 3–10 Connecting Systems Into a VAXcluster



❶ DSSI Cable (BC21M–09)

4
Hardware Options

This chapter describes the hardware options of VAX 4000 Model 105A/106A systems. It also describes how to connect the external hardware options to the system. It includes information on the following topics:

- Internal hardware options
- External hardware options
- Connecting a SCSI expansion box
- Connecting peripherals

Note

Illustrations in this manual show the VAX 4000 Model 106A system rather than the Model 105A system unless otherwise noted.

4.1 Internal Hardware Options

The system supports the following internal hardware options:

- MS44L-BC 16Mbytes set (4XMS44L-AA) and MS44-DC 64MB set (4XMS44-CA) memory modules—Model 105A/106A systems do not have any memory on the system board. They use only MS44L-BC and MS44-DC memory module bundles. You can increase the memory capacity of a Model 105A/106A system up to a maximum of 128MB in 16MB or 64MB increments using a maximum of two memory sets.
- Synchronous communications options—The system supports the DSW42-AA synchronous communications option. This communications option provides two synchronous communications ports and allows you to connect the system to a peripheral that uses an EIA-232 (V.24) 25-pin connector. You can use other interface standards with this option if you order different cables. Table 4–1 lists each interface standard and the part number of the corresponding cable.

Table 4–1 Interface Standards and Cable Part Numbers

Interface Standard	Cable Part Number	Extension Cable Part Number
EIA-232/V.24	BC19D-02[1]	BC22F-*nn*[3]
EIA-423/V.10	BC19E-02[2]	BC55D-*nn*[4]
EIA-422/V.11	BC19B-02[2]	BC55D-*nn*[4]

[1]Supplied with the DSW42-AA option.

[2]Optional cable, order separately.

[3]Optional cable, order separately. The value of *nn* represents the cable length in feet (10, 25, or 50).

[4]Optional cable, order separately. The value of *nn* represents the cable length in feet (25 or 50).

The BC19*x*-02 cables listed in Table 4–1 are 2-foot cables; extension cables are also available, but you must order them separately. Contact your Digital Sales representative for information on ordering any of the different cables that support these interface standards.

- Asynchronous communications options—The system supports three different asynchronous communications options. These options are as follows:
  - DHW42-AA—This asynchronous option provides eight asynchronous DEC423 data-line-only communications lines through one system port. You can connect up to eight peripherals using the MMJ ports on the harmonica (H3104) that connects to the option cable (BC16C-10).
  - DHW42-BA—This option is the same as the DHW42-AA, but provides 16 asynchronous DEC423 data-line-only communications lines through two system ports. You can connect up to 16 peripherals using the MMJ ports on two harmonicas (H3104) that connect to the option cables (BC16C-10).

  Use the following cables instead of the BC16C-10 cable if you require longer cable lengths: BC16C-25, BC16C-50, BC16C-A0, or BC16C-B5. Use the following cables between the harmonica (H3104) and the DEC423 peripheral: BC16E-10, BC16E-25, or BC16E-50.

  - DHW42-CA—This asynchronous option provides eight asynchronous EIA-232 modem control lines through two system ports using two breakout cables (BC29J-06).
  - DHW42-UP—This upgrade option converts a DHW42-AA asynchronous option to a DHW42-BA option.

Attach one of the following cables to a connector on the breakout cable if you require longer cable lengths: BC22F-10, BC22F-25, or BC22F-50. The peripheral you are using may require a null-modem extension cable. See the peripheral documentation or contact your Digital Sales representative for information on the correct null-modem cable to use.

- DSSI hard disk drives, including the following:
  - RF31T
  - RF35
  - RF36
- SCSI storage devices, including the following:

  SCSI hard disk drives:
  - RZ25L
  - RZ25M
  - RZ26
  - RZ26L
  - RZ28

  SCSI removable media devices:
  - TLZ06/TLZ07 tape drive
  - TZK10/TZK11 (QIC) tape drive
  - TZ30 tape drive
  - RRD42 compact disc drive
  - RRD43 compact disc drive
  - RX23 diskette drive
  - RX26 diskette drive
- Digital Storage Systems Interconnect (DSSI)– The KA53/KA54 CPU module contains one DSSI bus connector that is dedicated to the mass storage devices in your system.

  A DSSI connector provides a path to the DSSI bus through which the CPU can communicate with DSSI devices.

  The DSSI bus has the following characteristics.
  - A 4-Mbytes-per-second bandwidth

- Up to eight nodes (one interface and up to seven additional DSSI Devices (RF-series ISEs, TF85s, and adapters))
- Eight data lines
- One parity line
- Eight control lines

DSSI architecture improves system performance as follows.

- Each device queues requests and each performs seek ordering.
- Mass storage devices can act independently, since each device contains its own controller. Several devices can work simultaneously.

An ISE can maintain connection to more than one DSSI interface. That feature allows ISEs to be shared by multiple CPUs in a DSSI VAXcluster configuration.

For more information about DSSI VAXcluster configurations and the advantages of such configurations, see the section on DSSI VAXcluster capability in your system *Operation* manual.

4.2 External Hardware Options

The following sections contain information on connecting the external hardware options to the system unit. The external hardware options for VAX 4000 Model 105A/106A systems include the following:

- DSSI expansion box
- SCSI expansion box
- Q–bus expansion box
- Printers, terminals, modems, and other devices that use asynchronous or synchronous connectors

Your Digital Sales representative can give you information on how to order a full range of Digital DSSI and Q–bus expansion boxes, printers, terminals, modems, and other devices that are compatible with VAX 4000 Model 105A /106A systems.

4.3 Connecting a DSSI Expansion Box

To attach a DSSI expansion box, see Figure 3–8. (Figure 3–8 shows how to attach a DSSI cable from either a DSSI VAXcluster or a DSSI expansion box.)

4.4 Connecting a SCSI Expansion Box

The following subsections contain information on:

- Guidelines for connecting expansion boxes
- Selecting available SCSI IDs on the system
- Preparing the system unit for an expansion box
- Connecting the SCSI expansion box
- Checking the expansion box connections for Q–bus, DSSI, and SCSI

4.4.1 Guidelines for Connecting Expansion Boxes

Use the following guidelines when connecting expansion boxes:

- The recommended maximum length of the SCSI cables (internal length plus external length) is 19.6 feet (6 meters).
- Each device in the expansion boxes and the system box must have a unique SCSI ID.
- You must attach the 50-pin terminator that comes with the expansion box to an unused SCSI connector on the back of an expansion box.
- Plug the expansion boxes into the same grounded power strip or electrical circuit as the system.
- Do not connect more than two tape drive devices.

Caution

- Some expansion boxes are restricted to either 110 V ac or 220 V ac operation. Make sure that the voltage requirement of the expansion box used is compatible with the supply voltage.
- Turn on the expansion boxes before you turn on the system unit. This procedure ensures that the device in each expansion box is ready for use and that the system firmware includes the device in the configuration display.
- Do not connect or disconnect SCSI expansion boxes while the system is turned on. Doing so can cause damage to the equipment or corrupt data.
- Digital cannot guarantee the correct operation of any SCSI bus that uses cable assemblies not supplied by Digital or not configured in accordance with these guidelines.

4.4.2 Selecting Available SCSI IDs on the System

You must identify which SCSI IDs are available before connecting an expansion box. Use the configuration display to determine this information. To see the configuration display, enter the following command:

```
>>> SHOW CONFIG
```

The system displays information similar to the following:

```
KA53-A Vn.n, VMB 2.14
08-00-2B-2B-16-91
80MB

TstNbr  DevNam      Info
------  --------    --------------------------
     0    CPU_BD    OK
    A8    MEMORY    OK
    E4        DZ    OK
    E0      SCSI    OK  ❶
                    3-RZ24L   6-Adapter 7-RRD42 ❷
    5F        NI    OK
    5C      DSSI    OK
     0      QBUS    OK
    E8      COMM    OK
                    DSW41/42 2 CHANNEL V3.11-47
    EC     ASYNC    OK
                    DHW41/2 V1.6
```

❶ The letters OK by the SCSI device indicate that it has passed the power-on test.

❷ This line shows the SCSI IDs that are occupied by devices on the SCSI bus. For example, the RZ24 disk drive occupies SCSI ID 3 and the RRD42 drive occupies SCSI ID 7.

SCSI ID 6 is the default ID for the SCSI bus adapter.

There are eight SCSI IDs, numbered from 0 to 7. Select any SCSI ID that is not occupied by another device.

4.4.3 Preparing the System Unit for an Expansion Box

To prepare the system unit for an expansion box, follow these steps:

1. Shut down the operating system using the procedure outlined in the operating system documentation.
2. Set the on/off switch on the system unit to the off (O) position.
3. Remove the SCSI terminator as shown in Figure 4–1.
4. Move the terminator to the last open port on the SCSI expansion box.

4.4.4 Connecting the SCSI Expansion Box

Caution

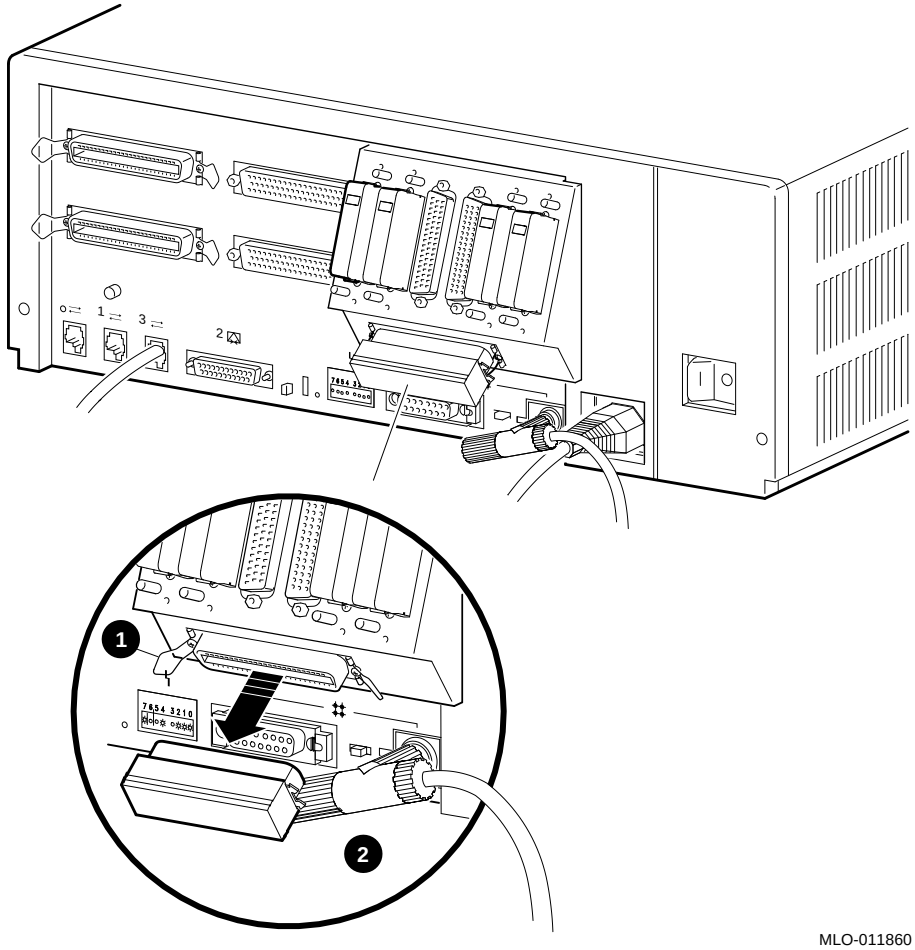
You must complete the procedures outlined in the following sections before you start the procedure in this section:

- Section 4.4, Connecting a SCSI Expansion Box
- Section 4.4.1, Guidelines for Connecting Expansion Boxes
- Section 4.4.2, Selecting Available SCSI IDs on the System
- Section 4.4.3, Preparing the System Unit for an Expansion Box

Connect the SCSI cable to the system unit and to the expansion box as follows:

1. Set the on/off switches on the system unit and the expansion box to the off (O) position.
2. Make sure that you have set the correct SCSI ID for each device in the expansion box. See Section 4.4.2 for information on selecting the available SCSI IDs.
3. Connect one end of the 50-pin to 50-pin cable, supplied with the expansion box, to the SCSI port on the system unit. Close the bail lock loops. See Figure 4–2.
4. Connect the other end of the 50-pin to 50-pin cable to either of the SCSI ports on the expansion box. Close the bail lock loops.
5. Connect the SCSI terminator to the other SCSI port on the expansion box. Close the bail lock loops.
6. Connect the power cord to the expansion box.
7. Connect the other end of the power cord to the same grounded power strip or electrical circuit.
8. Set the on/off switch on the expansion box to the on (|) position.
9. Set the on/off switch on the system unit to the on (|) position.
10. Check the system to ensure that it recognizes the connection. See Section 4.4.5 for information on checking expansion box connections.

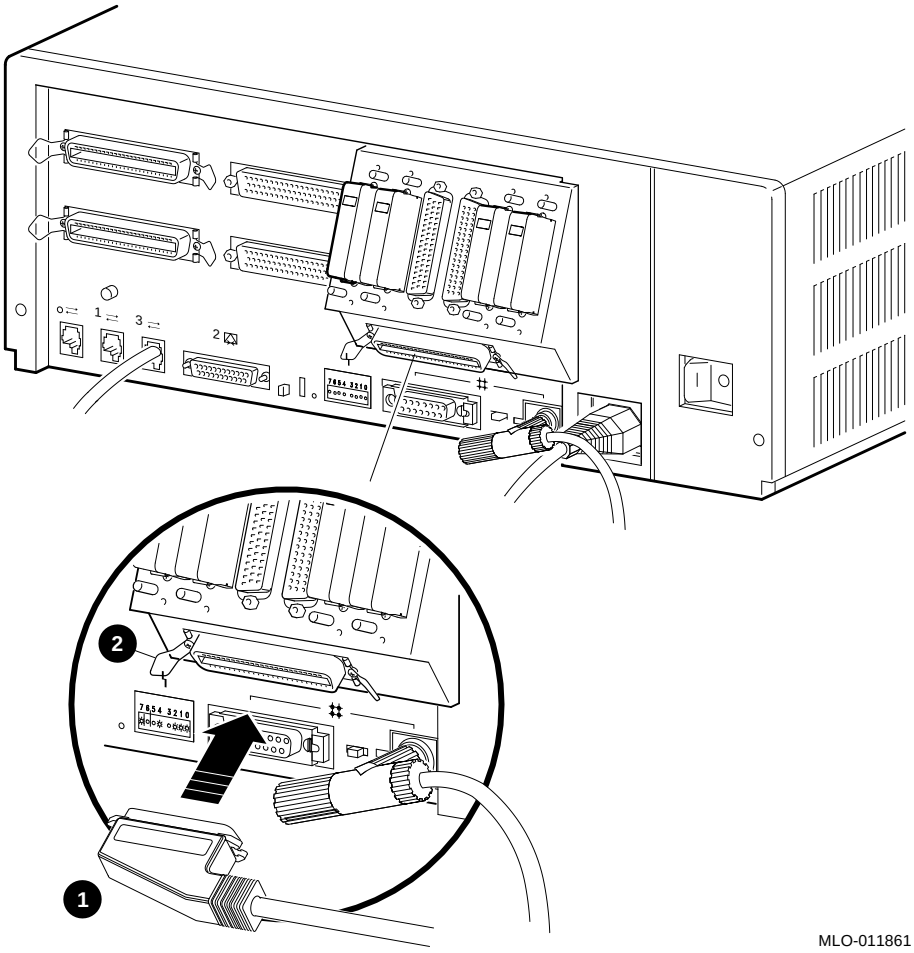
Figure 4–1 Removing the SCSI Terminator from the System Unit



❶ Release the bail lock loops.

❷ Remove the terminator.

Figure 4–2 Connecting the SCSI Cable to the System Unit



❶ SCSI Cable

❷ Bail Lock Loop

4.4.5 Checking Expansion Box Connections

Three different kinds of items can be connected to the expansion ports of VAX 4000 Model 105A/106A systems. They are the following:

- Q–bus
- DSSI
- SCSI

Examples 4–1, 4–2, and 4–3 show these types of items that are connected to the system, both internally and through the expansion ports.

Example 4–1 Checking Q–bus Devices

```
>>>SHOW QBUS
Scan of Qbus I/O Space
-20001468 (772150) = 0000 RQDX3/KDA50/RRD50/RQC25/KFQSA-DISK
-2000146A (772152) = 0AB0
-20001F40 (777500) = 0020 IPCR

Scan of Qbus Memory Space
-301E0000 to 3021FFFF (07400000 to 10377777)
>>>
```

Example 4–2 Checking DSSI Devices

```
>>>SHOW DSSI
DSSI Bus 0 Node 1 (R5WBAA)
-DIA1 (RF35)

DSSI Bus 0 Node 6 (KF72PB)

DSSI Bus 0 Node 7 (*)
```

Example 4–3 Checking SCSI Devices

```
>>>SHOW SCSI
SCSI Adapter A, SCSI ID 6
-DKA300 (DEC RZ24L)
-DKA700 (DEC RRD42)
```

If you do not see the names and the IDs of the devices, see the *VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information* manual.

4.5 Connecting Peripherals

The following subsections contain information on the following tasks:

- Connecting peripherals to a DEC423 MMJ port
- Connecting a peripheral to the asynchronous modem control port (port 2)
- Connecting peripherals to an optional asynchronous port
- Connecting peripherals to an optional synchronous port

4.5.1 Connecting Peripherals to a DEC423 MMJ Port

Note

When the system is shipped, MMJ ports 0 and 1 are covered with an arrow label identifying port 3 as the console port. When port 3 has been identified, the OPA0 arrow label may be removed.

To connect peripherals that use DEC423 cables (BC16E) to MMJ ports 0, 1, or 3, follow these steps:

1. Set the on/off switch on the peripheral to the off (O) position.
2. Connect one end of the DEC423 cable to either MMJ port 0, 1, or 3 (see Figure 4–3).

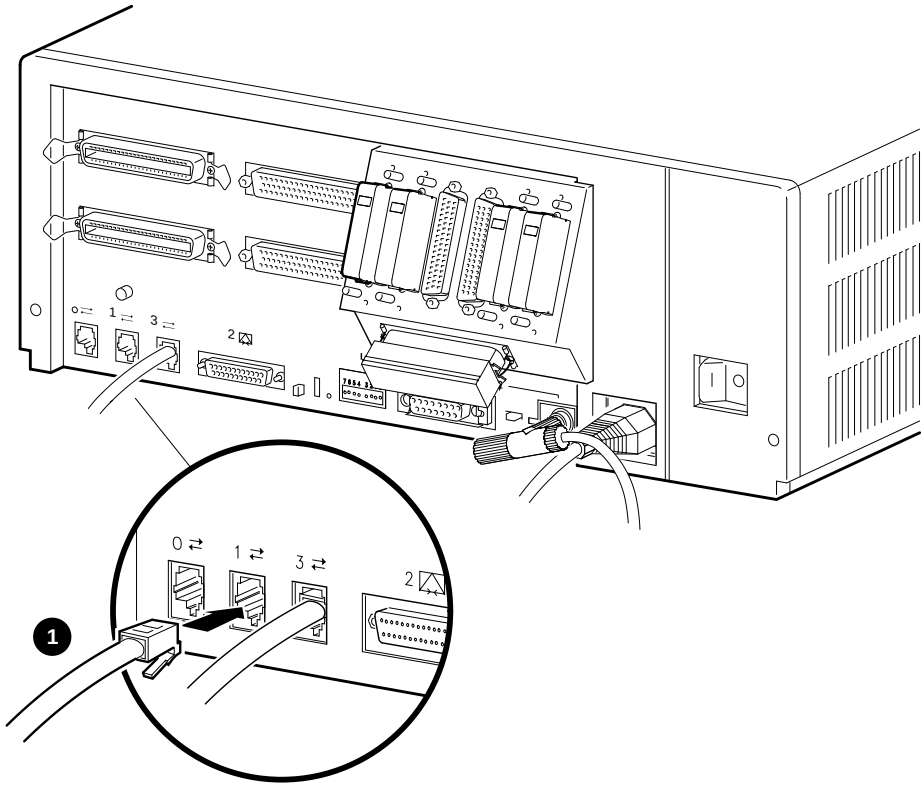
Note

In some countries, the peripheral cable has an earth drain wire. Connect this earth drain wire to the grounding pillar above MMJ port 1 using the screw provided with the cable.

3. Connect the other end of the DEC423 cable to the correct port on the peripheral.
4. Set the on/off switch on the peripheral to the on (|) position.

BC16E cables are available in the following lengths: 10 feet (BC16E-10), 25 feet (BC16E-25), or 50 feet (BC16E-50).

Figure 4–3 Connecting a Peripheral to MMJ Port 1



MLO-011862

❶ DEC423 Peripheral Cable

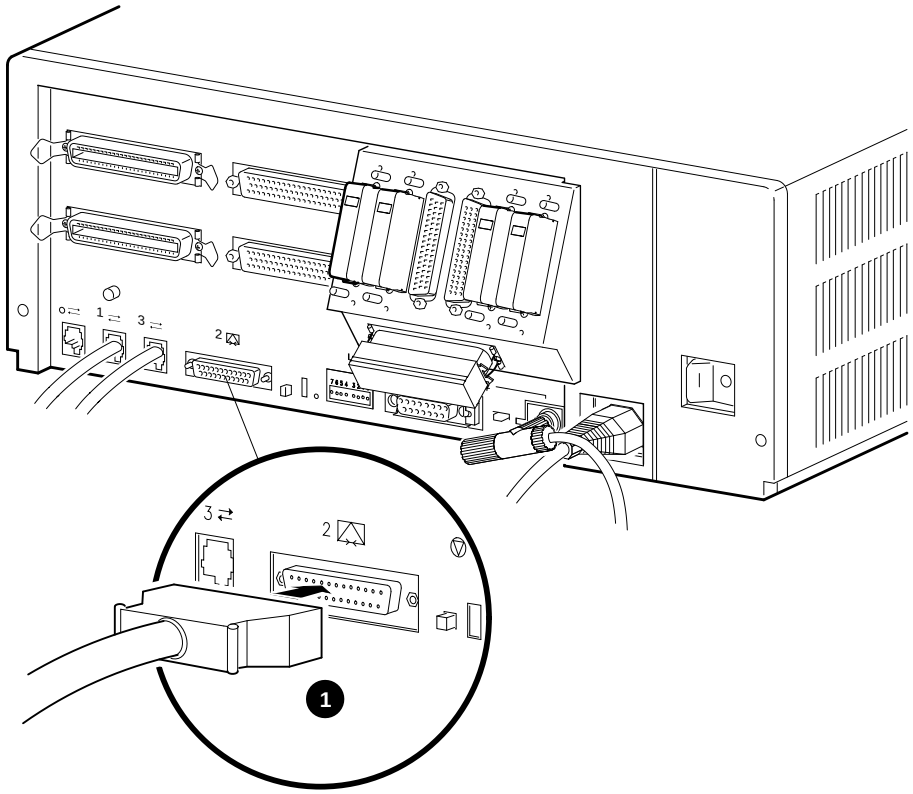
4.5.2 Connecting a Peripheral to the Asynchronous Modem Control Port

You can connect peripherals that use EIA-232 connectors to the asynchronous modem control port (port 2) on the back of the system unit. Alternatively, the supplied EIA-232 to DEC423 adapter (H8575-A) allows you to connect peripherals that use DEC423 connectors. To connect a peripheral to the asynchronous modem control port, follow these steps:

1. If you are connecting a peripheral using EIA-232 cables, follow these steps:
   a. Set the on/off switch on the peripheral to the off (O) position.
   b. Connect the 25-pin D-sub connector of the peripheral cable to the asynchronous modem control port (see Figure 4–4).
   c. If the connector has screws on either side, tighten them using a small screwdriver.
   d. Connect the other end of the peripheral cable to the correct port on the peripheral.
   e. Set the on/off switch on the peripheral to the on (|) position.

   EIA-232 cables are available in the following lengths: 10 feet (BC22F-10), 25 feet (BC22F-25), or 50 feet (BC22F-50). The peripheral you are using may require a null-modem extension cable. See the peripheral documentation or contact your Digital Sales representative for information on the correct null-modem cable to use.

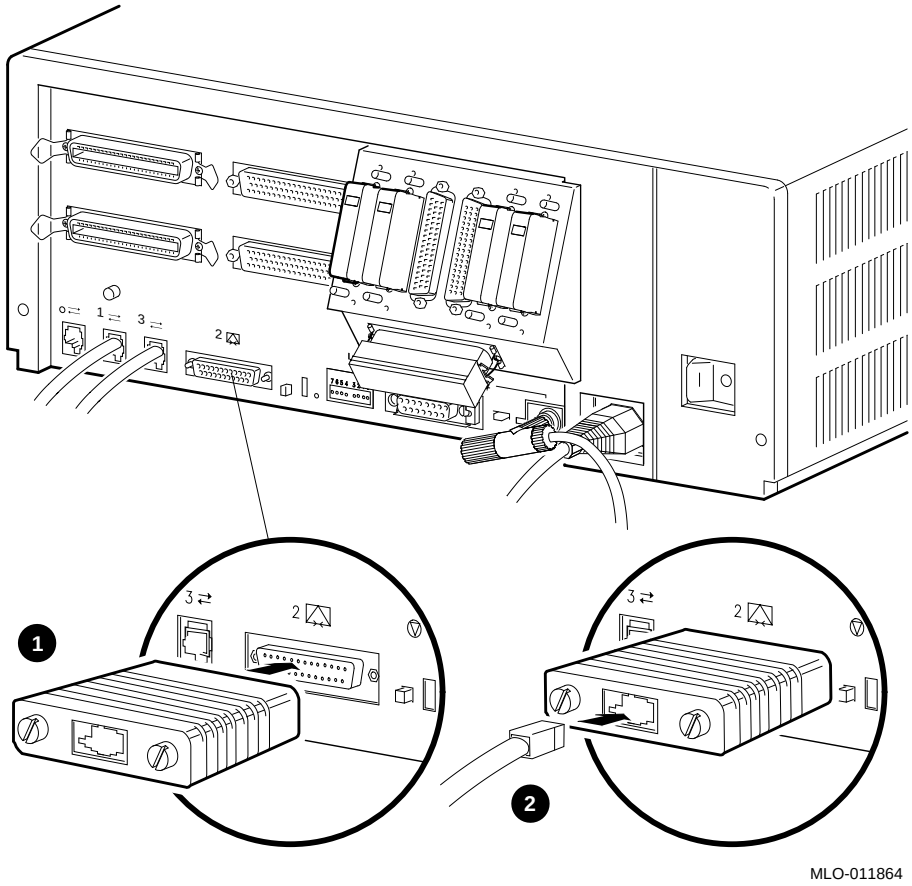
Figure 4–4 Connecting a Peripheral to the Asynchronous Modem Control Port



❶ EIA-232 Connector

2. If you are connecting a peripheral using DEC423 cables, follow these steps:
   a. Set the on/off switch on the peripheral to the off (O) position.
   b. Connect the EIA-232 to DEC423 adapter to the asynchronous modem control port (see Figure 4–5).
   c. Tighten the screws on each side of the adapter using a small screwdriver.
   d. Connect the DEC423 cable to the MMJ port on the adapter.
   e. Connect the other end of the DEC423 cable to the correct port on the peripheral.
   f. Set the on/off switch on the peripheral to the on (|) position.

Figure 4–5 Connecting a Peripheral to the Asynchronous Modem Control Port Using an EIA-232 to DEC423 Adapter



❶ EIA-232 to DEC423 Adapter (H8575-A)

❷ DEC423 MMJ Connector

4.5.3 Connecting Peripherals to an Optional Asynchronous Port

There are three asynchronous communications options for VAX 4000 Model 105A/106A systems:

- DHW42-AA—Provides one eight-line data-line-only asynchronous port
- DHW42-BA—Provides two eight-line data-line-only asynchronous ports
- DHW42-CA—Provides two four-line asynchronous ports with modem control

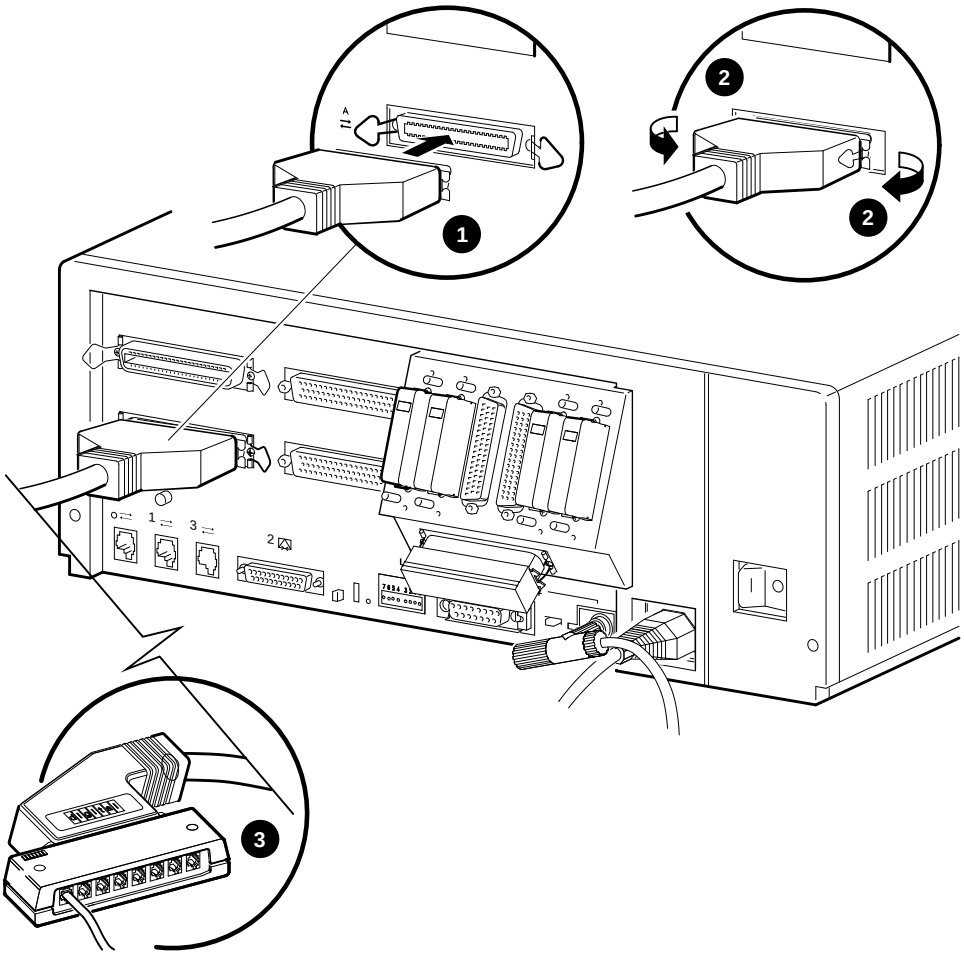
Connecting Peripherals to a DHW42-AA or DHW42-BA Option

If the system has the DHW42-AA or DHW42-BA asynchronous communications option installed, the system has one or two eight-line data-only asynchronous ports. You can connect up to eight peripherals to each of these ports using the H3104 harmonica. Section 4.1 gives more information on the DHW42-AA and DHW42-BA asynchronous communications options.

To connect a peripheral to an asynchronous port, follow these steps:

1. Set the on/off switch on the peripheral to the off (O) position.
2. Connect the straight connector of the BC16C-10 cable to one of the asynchronous ports on the back of the system unit (see Figure 4–6).
3. Close the bail lock loops on each side of the connector.
4. Connect the angled connector of the BC16C-10 cable to the H3104 harmonica.
5. Close the bail lock loops on each side of the connector.
6. Connect one end of a DEC423 cable to one of the eight MMJ ports on the harmonica.
7. Connect the other end of the DEC423 cable to a DEC423 port on the peripheral.
8. Set the on/off switch on the peripheral to the on (|) position.

Figure 4–6 Connecting a Peripheral to Asynchronous Port A



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❶ Asynchronous Option Cable (BC16C-10)

❷ Bail Lock Loops

❸ Harmonica

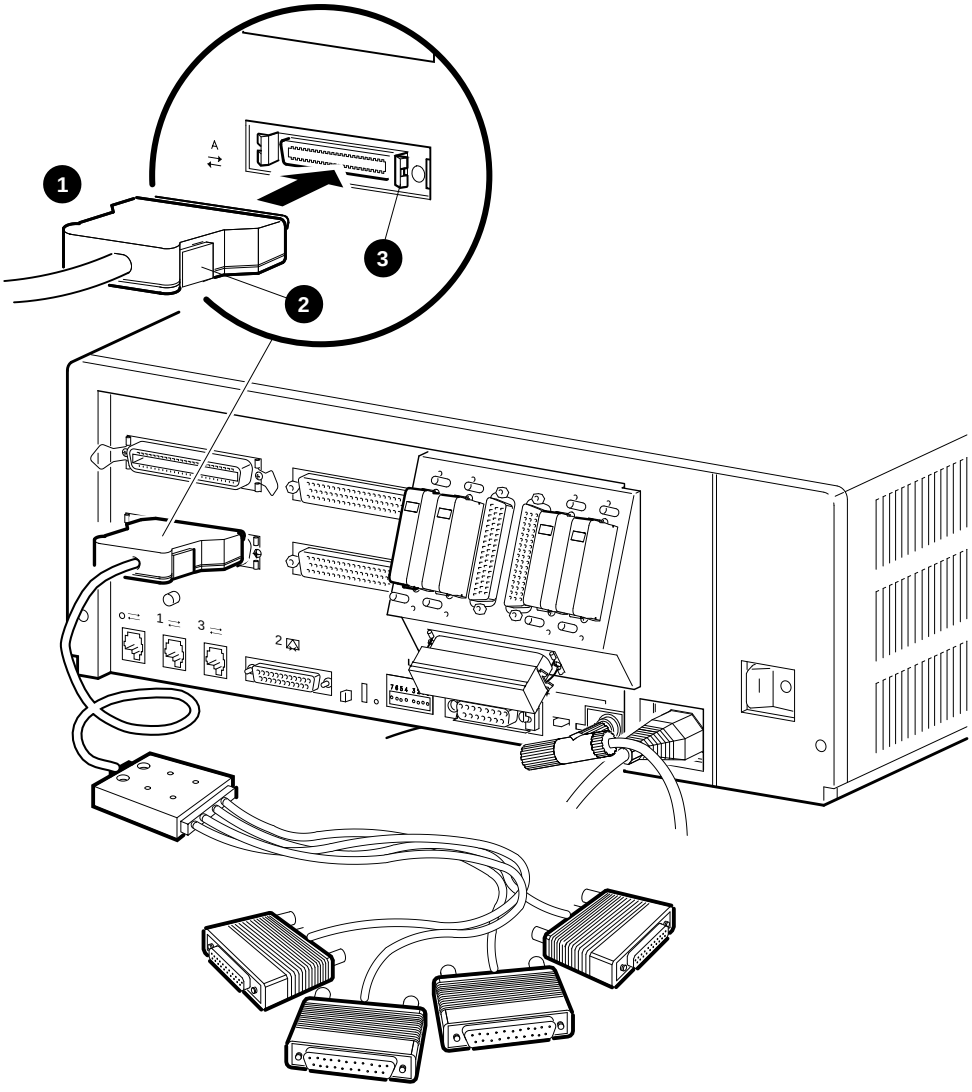
Connecting Peripherals to a DHW42-CA Option

If the system has the DHW42-CA asynchronous communications option installed, the system has two four-line asynchronous ports with modem control. You can connect up to four peripherals to each of these ports using the breakout cable (BC29J-06) supplied with the option. Section 4.1 gives more information on the DHW42-CA asynchronous communications option.

To connect a peripheral to an asynchronous port, follow these steps:

1. Set the on/off switch on the peripheral to the off (O) position.
2. Hold in the connector clips on either side of the 50-pin connector of the breakout cable and connect it to one of the asynchronous ports on the back of the system unit (see Figure 4–7).
3. Release the clips. The hooks on the port secure the connector in place.
4. Connect one of the four EIA-232 connectors on the breakout cable to the peripheral.
5. Set the on/off switch on the peripheral to the on (|) position.

Figure 4–7 Connecting a Peripheral to Asynchronous Port A (DHW42-CA)



❶ Asynchronous Option Breakout Cable (BC29J-06)

❷ Connector Clip

❸ Hook

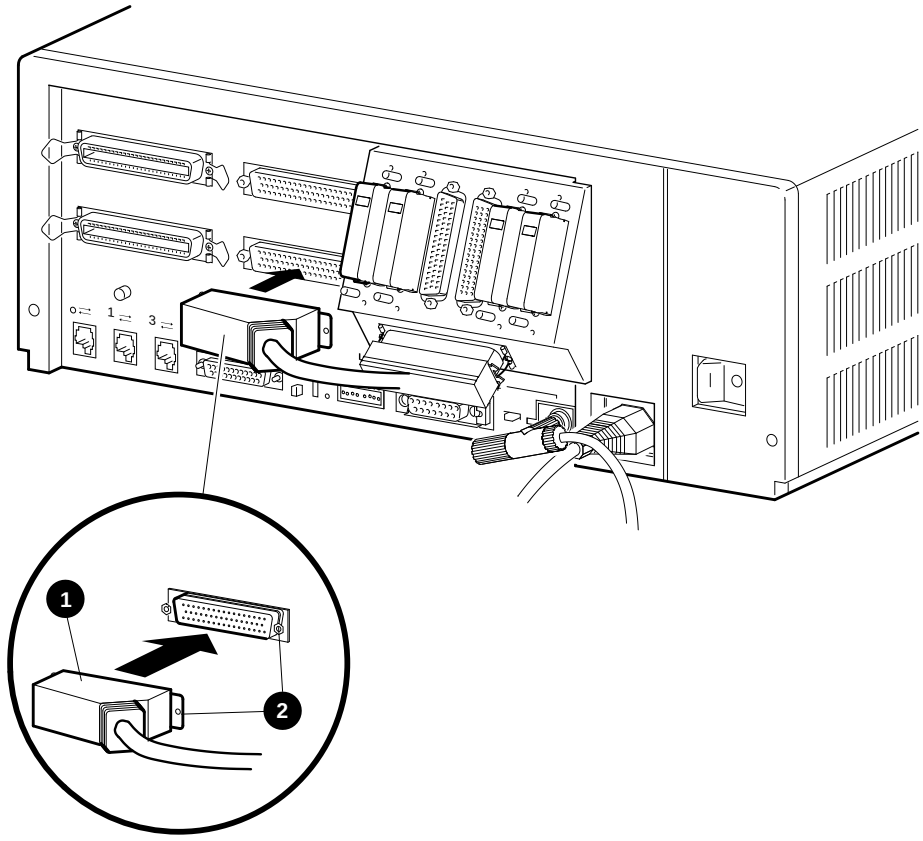
4.5.4 Connecting Peripherals to an Optional Synchronous Port

If the system has the DSW42-AA synchronous communications option installed, the system has two synchronous modem ports. Section 4.1 gives more information on the DSW42-AA synchronous communications option. Table 4–1 lists the cables that you can use with the option. The EIA-232/V.24 cable (BC19D-02) is the standard cable shipped with the option. If you are using a synchronous interface standard other than EIA-232/V.24, use one of the optional cables listed in Table 4–1.

To connect a peripheral to a synchronous port, follow these steps:

1. Set the on/off switch on the peripheral to the off (O) position.
2. Connect the 50-pin connector of the option cable to one of the synchronous ports on the back of the system unit (see Figure 4–8).
3. Connect the other connector of the option cable to the communications port on the peripheral.
4. If the option cable connectors are fitted with screws, secure the connectors to the ports by tightening them on each side.
5. Set the on/off switch on the peripheral to the on (|) position.

Figure 4–8 Connecting the Cable to Synchronous Port 0



❶ Option Cable (BC19D–02)

❷ Optional Screws (2)

A

Associated and Related Documents

This appendix lists the associated and related documents. Some of the following documents may not be available in every country. Contact your Digital sales representative for information on the availability of particular documents.

A.1 Associated Documents

The following documents contain information on VAX 4000 Model 105A/106A systems:

- Acoustic Declaration for VAX 4000 BA42B Systems (EK–464AA–AN)
- VAX 4000 Model 105A/106A Customer Letter (EK–511AA–CL)
- VAX 4000 Model 105A/106A Installation Information (EK–512AA–IN)
- VAX 4000 Model 105A/106A Operator Information (EK–513AA–OP)
- VAX 4000 Model 105A/106A Customer Technical Information (EK–514AA–TI)
- VAX 4000 Model 105A/106A Troubleshooting and Diagnostics Information (EK–515AA–TS)

VMS Factory Installed Software (FIS) Documentation

The following document contains information on VMS FIS:

- *VMS Factory Installed Software User Guide* (EK–A0377–UG)

A.2 Related Documents

The following documents contain information related to the system:

Internal Removable Media Device Documentation

- *TZ30 Cartridge Tape Drive Subsystem Owner's Manual* (EK–OTZ30–OM)
- *TZK10 Cartridge Tape Drive Owner's Guide* (EK–TZK10–OG)
- *TZK11 Backup System User Manual* (EK–TZK11–UG)
- *TLZ06 Cassette Tape Drive Owner's Manual* (EK–TLZ06–OM)
- *TLZ07 Cassette Tape Drive Owner's Manual* (EK–TLZ07–OM)
- *RRD42 Disc Drive Owner's Manual* (EK–RRD42–OM)
- *RRD43 CD–ROM Drive Installation Guide* (EK–RRD43–IN)
- *RX23 Diskette Drive Upgrade Installation* (EK–RX23D–UG)
- *RX26 Diskette Drive Option Installation* (EK–RX26M–IN)

VAX Handbook Series

- *VAX Architecture Handbook* (EB–19580–20)
- *VAX Software Handbook* (EB–21812–20)

DECconnect System Documentation

- *DECconnect System General Description* (EK–DECSY–GD)
- *DECconnect System Requirements Evaluation Workbook* (EK–DECSY–EG)
- *DECconnect System Installation and Verification Guide* (EK–DECSY–VG)
- *DECconnect System Standalone ThinWire Networks: Planning and Installation Guide* (EK–DECSY–TG)
- *DECconnect System Planning and Configuration Guide* (EK–DECSY–CG)
- *Workstations Network Guide* (EK–VS315–GD)

B

Removable Storage Media

This appendix contains information on the use and storage of the following media types that are used by the optional removable media storage devices:

- Tape cartridges
- QIC tapes
- Cassette Tapes (DAT)
- Compact discs

B.1 Tape Cartridges

The CompacTape cartridge (see Figure B–1) is a 10 cm by 10 cm (4 inches by 4 inches) plastic tape cartridge that can be used by TZ30 or TK50 tape drives. The TZ30 tape drive is supplied with a CompacTape.

The CompacTape II is the successor to the CompacTape cartridge. The CompacTape II has tighter tolerances than the CompacTape, which support the higher recording densities of the TK70. The CompacTape and the CompacTape II (when used with TZ30 and TK50 tape drives) have a capacity of 95MB.

The TZ30 can use a CompacTape or CompacTape II cartridge that was originally written by the TK50. If a CompacTape II cartridge written by a TK70 is used on a TZ30, the TZ30 automatically unloads the tape cartridge, because the TZ30 cannot read the tape cartridge. The green LED flashes, indicating a tape error.

Figure B–1 CompacTape Cartridge

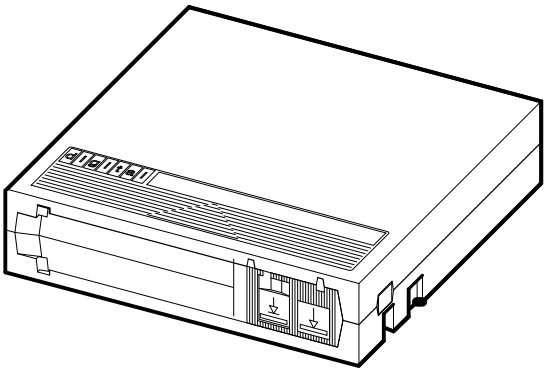


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Table B–1 and Table B–2 show the compatibility of CompacTape and CompacTape II tape cartridges with TZ30, TK50, and TK70 tape drives.

Table B–1 Noninitialized Cartridge Compatibility

	CompacTape (TK50-K)	CompacTape II (TK52-K)
TZ30 drive	Yes	Yes
TK50 drive	Yes	Yes
TK70 drive	No	Yes

Table B–2 Initialized Cartridge Compatibility

	TK50 Drive	TK70 Drive	TZ30 Drive
TZ30 initialized cartridge	R/W[2]	R[1]	R/W
TK50 initialized cartridge	R/W	R	R/W
TK70 initialized cartridge	NC[3]	R/W	NC

[1]Read only

[2]Read/write

[3]Not compatible

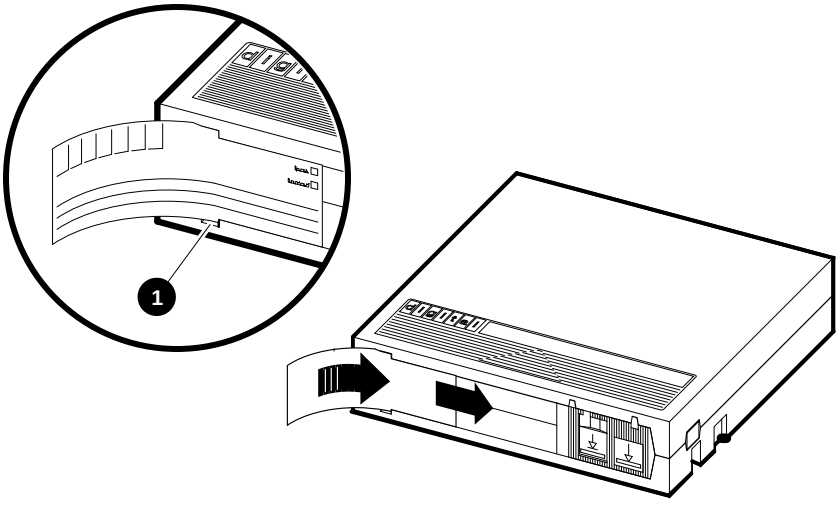
B.1.1 Labeling a Tape Cartridge

Always label tape cartridges. There is a slot for the label on the front of the cartridge. See Figure B–2. The label is visible when the cartridge is in the drive. Labels or markings on any other part of the cartridge can interfere with the proper operation of the drive. Do not write on the cartridge with a pen, pencil, or other marking instrument.

The labels supplied with the CompacTape II cartridges have spaces that mark the capacity of the tape cartridge. If a TK50 or TZ30 wrote data to the tape cartridge, mark the 95MB block on the label. If a TK70 wrote data to the tape cartridge, mark the 296MB block on the label.

If you use TK70 and TZ30 drives, note that the TZ30 is unable to read or write tapes that have originally been written to by the TK70. However, the TK70 can read tapes written by the TZ30 or the TK50.

Figure B–2 Labeling the Tape Cartridge



❶ Label Slot

B.1.2 Writing to and Write-Protecting Tape Cartridges

CompacTape and CompacTape II cartridges have a write-protect switch that prevents an accidental overwrite of data. The system can read information on the tape regardless of the position of the write-protect switch. However, the system cannot write data to a write-protected tape.

Write-Protecting a Tape

When you use a tape to install software, set the write-protect switch on the front of the cartridge to the write-protect position by sliding it left towards the label until it locks in place (see Figure B–3). An orange rectangle appears when the write-protect switch locks in the write-protect position.

Writing to a Tape

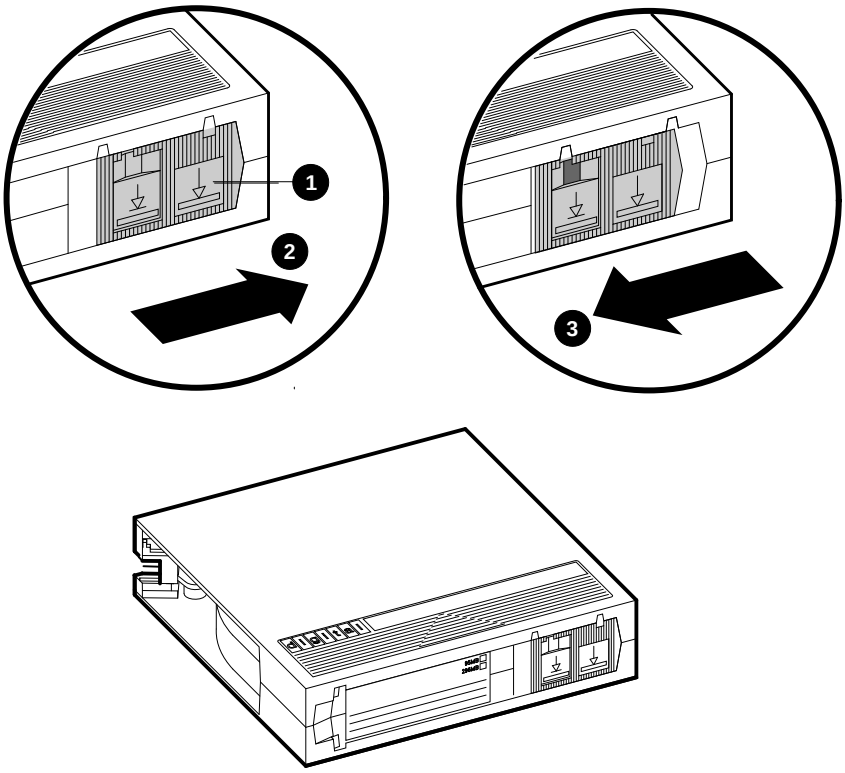
When you use a tape to make a backup copy or to write data, set the write-protect switch to the write-enable position. To set the switch to the write-enable position, slide it to the right, away from the label, until the switch locks in place.

B.1.3 Handling and Storing Tape Cartridges

Inside the cartridge, a 600-foot single reel of magnetic tape stores data. A plastic tape leader is at the beginning of the tape. Take the following precautions when handling and storing tapes:

- Do not touch the exposed surface of the tape.
- Do not drop the tape cartridge.
- Allow tape cartridges to reach room temperature before using them.
- Store the tape where the room temperature is between 10°C and 40°C (50°F and 104°F) and the humidity is between 20% and 80%.
- Place the identification label in the slot provided on the tape cartridge.
- Store the tape cartridge in its plastic cover.
- Do not expose the tape to direct sunlight, heat, magnetic fields, or X-rays.

Figure B–3 Write-Protect Switch Positions



❶ Write-Protect Switch

❷ Write-Enable Position

❸ Write-Protected Position

B.2 Quarter-Inch Cartridge (QIC) Tapes

Compatible tapes are shown in Table B–3 for the TZK10, and Table B–4 for the TZK11. Figure B–4 shows a DC6320 as an example.

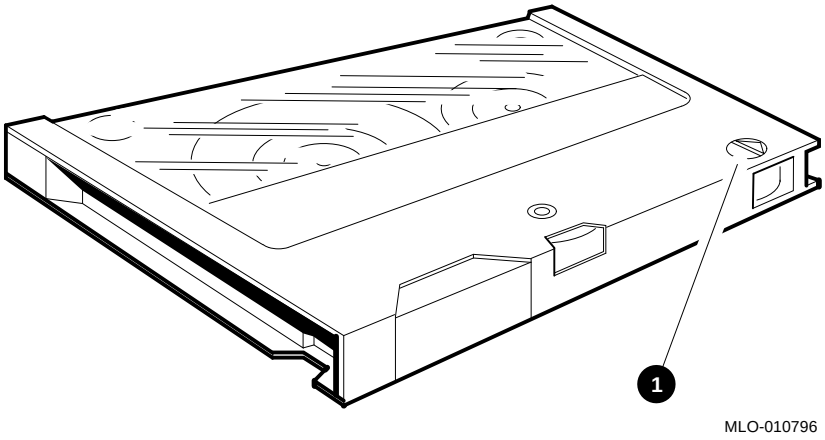
Table B–3 TZK10 Cartridge Compatibility

Cartridge	Capacity	Format	R/W
DC6525	Up to 525MB	QIC-525	R/W
DC6320	Up to 320MB	QIC-320	R/W

Table B–4 TZK11 Cartridge Compatibility

Cartridge	Capacity	Format	R/W
DC9200XL	Up to 2.5 GB	QIC-2GB	R/W
DC9200	Up to 2.0 GB	QIC-2GB	R/W
DC9100L	Up to 1.2 GB	QIC-1GB	R/W
DC9100	Up to 1.0 GB	QIC-1GB	R/W
DC6525	Up to 525MB	QIC-525	R/W
DC6320	Up to 320MB	QIC-320	R/W

Figure B–4 QIC Tape



❶ Write-Protect Switch

B.2.1 Guidelines for Using QIC Tapes

Use the following guidelines when using QIC tapes:

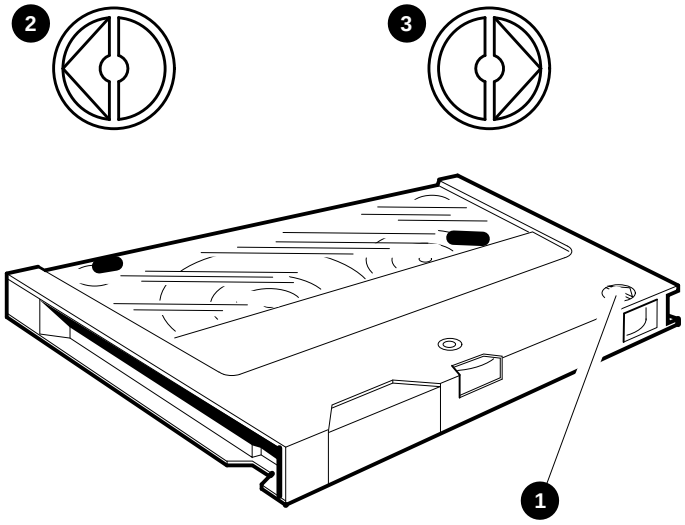
- Do not drop the tape.
- Store the tape where the room temperature is between 10°C and 40°C (50°F and 104°F) and the humidity is between 20% and 80%.
- Do not expose the tape to direct sunlight, abrasive particles, or electromagnetic fields.
- Store the QIC tape in its protective container, placed on its edge, or stacked. Do not stack QIC tapes more than five high.
- Place the identification label in the space provided on the top of the QIC tape.

B.2.2 Setting the QIC Tape Write-Protect Switch

There is a write-protect switch on one corner of the QIC tape, as shown in Figure B–5. This switch allows you to write-protect the data on the tape. After writing data to the QIC tape, write-protect the tape to prevent accidental erasure or overwriting of that data. Use the write-protect switch as follows:

- Turn the write-protect switch to the safe (write-protect) position when you want to protect the data on the tape, or when you want to read or copy data from the tape.
- Turn the write-protect switch to the write-enable position when you want to write data to the tape.

Figure B–5 QIC Tape Write-Protect Switch



❶ Write-Protect Switch

❷ Write-Enable Position

❸ Write-Protected Position

B.3 Cassette Tapes (DAT)

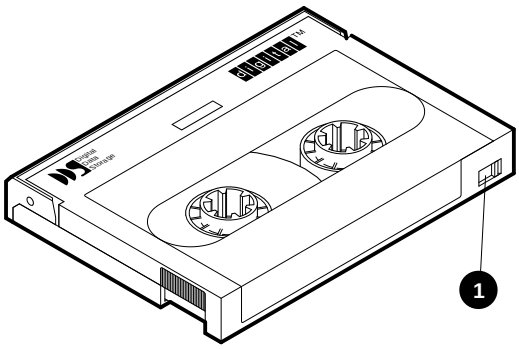
The TLZ06/TLZ07 tape drive is a 4-mm DAT DDS SCSI-2 device. It reads data from and writes data to industry-standard cassette tapes. Table B–5 lists the supported cassette tapes. Figure B–6 shows a TLZ06/TLZ07 cassette tape and write-protect switch.

Table B–5 TLZ06/TLZ07 Cassette Tape Compatibility

Cassette	Capacity	Capacity with Compression
TLZ04-CA	1.3 GB	Up to 2.6 GB
TLZ06-CA	2.0 GB	Up to 4.0 GB
TLZ07-CA[1]	4.0 GB	Up to 8.0 GB

[1]The TLZ07-CA cassette is only compatible with the TLZ07 tape drive.

Figure B–6 TLZ Cassette Tape



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❶ Write-Protect Switch

B.3.1 Guidelines for Using Cassette Tapes

Use the following guidelines when using cassette tapes:

- Do not drop the tape.
- Store the tape where the room temperature is between 5°C and 32°C (40°F and 90°F) and the humidity is between 20% and 60%.
- Do not expose the tape to direct sunlight, abrasive particles, or electromagnetic fields.
- Store the cassette tape in its protective container, placed on its edge, or stacked. Do not stack cassette tapes more than five high.

B.3.2 Setting the Cassette Tape Write-Protect Switch

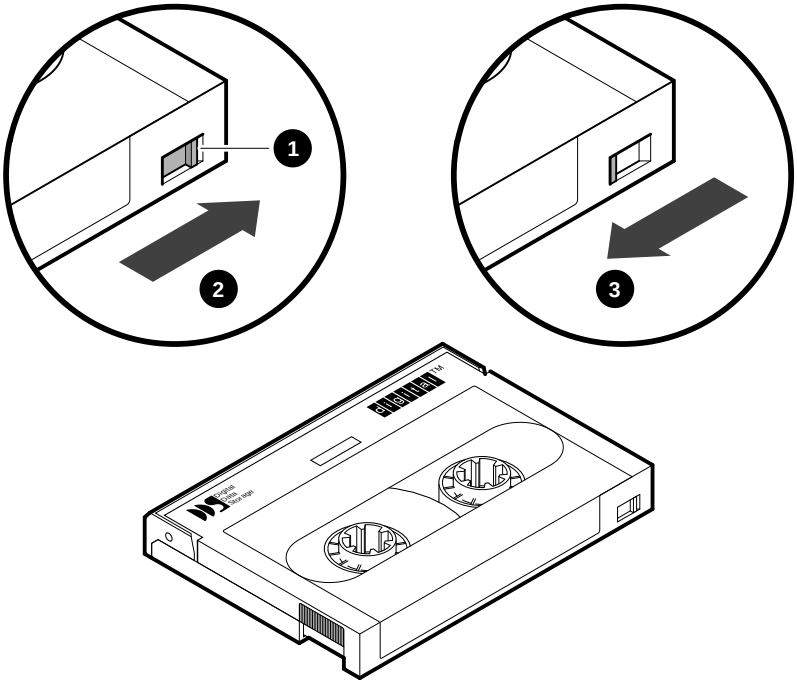
There is a write-protect switch on one corner of the cassette tape. This switch allows you to write-protect the data on the tape. After writing data to the cassette tape, write-protect the tape to prevent accidental erasure or overwriting of that data. Use the write-protect switch shown in Figure B–7 as follows:

- Use a pen to slide the write-protect switch to the left (write-protect) position when you want to protect the data on the tape, or when you want to read or copy data from the tape.
- Use a pen to slide the write-protect switch to the right (write-enable) position when you want to write data to the tape.

Caution

Do not use a pencil to slide the write-protect switch. Graphite dust can damage the cassette tape.

Figure B–7 Setting the Write-Protect Switch on a Cassette Tape



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❶ Write-Protect Switch

❷ Write-Enable Position

❸ Write-Protected Position

B.4 Compact Discs

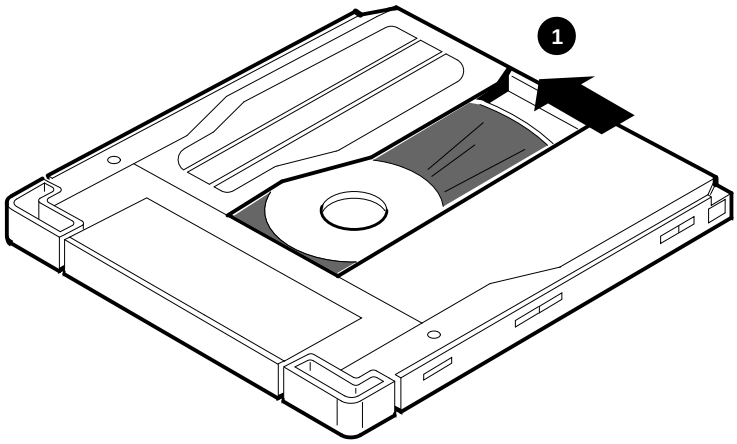
Compact discs are used with caddy in the RRD42 (see Section B.4.1) and without a caddy in the RRD43 (see Section B.4.2).

B.4.1 RRD42 Compact Disc with Caddy

When you use the RRD42 compact disc drive, you insert the disc, enclosed in a caddy, into the drive. You must take the following precautions when handling discs and caddies:

- Do not drop the disc or the caddy.
- The shutter on the caddy, shown in Figure B–8, automatically opens when you insert it into the RRD42. Do not open the caddy manually or touch the disc.

Figure B–8 Compact Disc and Caddy



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❶ Caddy Shutter

- Do not disassemble the caddy; it is adjusted for use with the RRD42.
- Remove the caddy from the RRD42 before moving the system.
- Do not expose the compact disc or caddy to high humidity, high temperature, excessive dust, or direct sunlight.

- Hold the compact disc by its edges; never touch the surface.
- Use a proper compact disc cleaner to wipe the compact disc if it gets dirty.
- Return the disc to its storage device when not in use.

B.4.2 RRD43 Compact Disc without Caddy

When you use the RRD43 compact disc drive, you insert the disc directly into the drive. You must take the following precautions when handling discs.

- Do not drop the disc.
- Remove the disc from the RRD43 before moving the system.
- Do not expose the compact disc to high humidity, high temperature, excessive dust, or direct sunlight.
- Hold the compact disc by its edges; never touch the surface.
- Use a proper compact disc cleaner to wipe the compact disc if it gets dirty.

C

Programming Parameters for DSSI Devices

This appendix describes the console mode procedures for setting and examining parameters for DSSI devices.

Note

Before you reprogram DSSI devices, you should have a good understanding of DSSI architecture and VAXcluster software operation. If you do not have that understanding, you should read the VMS manuals listed in Appendix A or call your Digital service representative.

On VAX 4000 Model 105A/106A systems, an embedded DSSI adapter on the KA53/KA54 CPU provides the interface between the CPU and the DSSI storage devices.

The KFDDA-BA daughter card adapter provides a DSSI bus that can support up to eight nodes, where the adapter and each DSSI storage device count as one node, hence each DSSI adapter can support up to seven DSSI storage devices (six DSSI storage devices for a two-system DSSI VAXcluster configuration; five DSSI storage devices for a three-system DSSI VAXcluster configuration). The adapter makes a connection between the CPU and the requested device on the respective DSSI bus. Each DSSI device has its own controller and server that contain the intelligence and logic necessary to control data transfers over the DSSI bus.

Note

On some sytems, an optional DSSI daughter card (KFDDA–AA) provides two DSSI interface adapters, so there are two DSSI buses with the same specifications.

C.1 DSSI Device Parameters

Seven principal parameters are associated with each DSSI device:

- Bus Node ID
- ALLCLASS
- UNITNUM
- FORCEUNI
- NODENAME
- SYSTEMID
- DSSI NODE ID

Each of these seven parameters, with the exception of the Bus Node ID, are programmed and examined using the console-based Diagnostic and Utility Program (DUP) driver utility. The Bus Node ID is physically determined by jumpers on the disk drive.

A brief description of each parameter follows.

The Bus Node ID parameter is provided by the jumpers on the disks. Each DSSI bus can support up to eight nodes, 0–7. Each DSSI adapter and each device count as a node. Hence, in a single-system configuration, a DSSI bus can support up to seven devices, bus nodes 0–6 (with node 7 reserved for the adapter); in a two-system DSSI VAXcluster configuration, up to six devices, 0–5 (with nodes 6 and 7 reserved for the adapters); in a three-system DSSI VAXcluster configuration, up to five devices, 0–4 (with nodes 5, 6, and 7 reserved for the adapters).

The ALLCLASS parameter determines the device allocation class. The allocation class is a numeric value from 0 to 255 that is used by the VMS operating system to derive a path-independent name for multiple access paths to the same device. The ALLCLASS firmware parameter corresponds to the VMS SYSGEN parameter ALLOCLASS.

DSSI devices are shipped from the factory with a default allocation class of zero. Each device to be served to a cluster should have a nonzero allocation class that matches the allocation class of the system. Refer to the *DSSI VMScluster* guide for rules for specifying allocation class values.

The UNITNUM parameter determines the unit number of the device. By default, the device unit number is supplied by the jumpers on the drives. Systems with multiple DSSI busses, as described later in this section, require that the default values be replaced with unique unit numbers. To set unit numbers and override the default values, you use the console-based DUP

driver utility to supply values to the UNITNUM parameter and to set a value of zero to device parameter FORCEUNI.

The FORCEUNI parameter controls the use of UNITNUM to override the default device unit number supplied by the jumpers. When FORCEUNI is set to a value of zero, the operating system uses the value assigned to the UNITNUM parameter; when FORCEUNI is set to a value of one, the operating system uses the value supplied by the jumpers.

The NODENAME parameter allows each device to have an alphanumeric node name of up to eight characters. DSSI devices are shipped from the factory with a unique identifier, such as R7CZZC, R7ALUC, and so on. You can provide your own node name.

The SYSTEMID parameter provides a number that uniquely identifies the device to the operating system. That parameter may need to be modified only when replacing a device. Only Digital service representatives and licensed self-maintenance customers should remove devices.

DSSI NODE ID is the unique number held by one DSSI node within one DSSI bus. See Figure C–1 and Table C–1 for instructions for setting the DSSI Node ID.

Figure C–1 Setting the DSSI Node ID

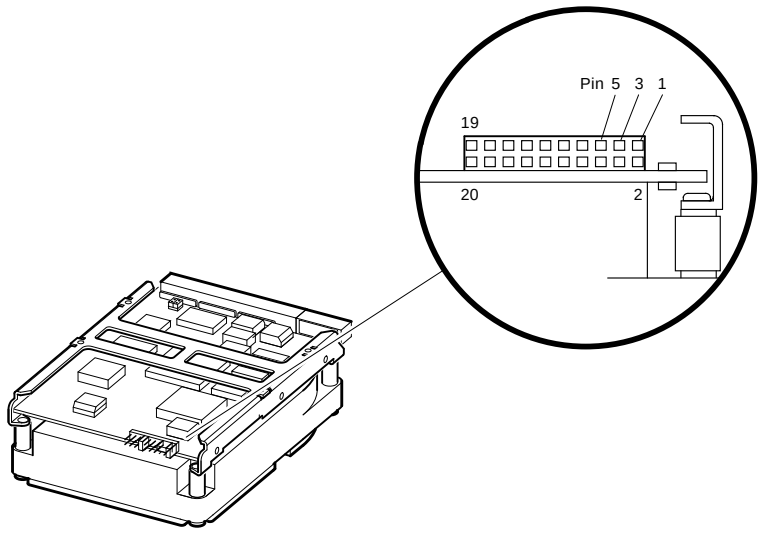

Table C–1 RF31/RF35/RF36 DSSI ID Jumper Combinations

DSSI ID	Pin 5	Pin 3	Pin 1
0	Out	Out	Out
1	Out	Out	In
2	Out	In	Out
3	Out	In	In
4	In	Out	Out
5	In	Out	In
6	In	In	Out
7	In	In	In

C.2 How VMS Uses the DSSI Device Parameters

This section describes how the operating system uses the parameters to form unique identifiers for each device. Configurations that require you to assign new unit numbers for devices are also described.

With an allocation class of zero, the operating system can use the default parameter values to provide each device with a unique device name. The operating system uses the node name along with the device logical name in the following manner.

NODENAME$DIA*u*

where NODENAME is a unique node name, and *u* is the unit number.

With a nonzero allocation class, the operating system relies on unit number values to create a unique device name. The operating system uses the allocation class along with the device logical name in the following manner.

$ALLCLASS$DIA*u*

where ALLCLASS is the allocation class for the system and devices, and *u* is a unique unit number.

Figure C–2 illustrates the need to program unit numbers for a system using more than one DSSI bus and a nonzero allocation class. In the case of the nonzero allocation class, the operating system sees three of the integrated storage elements (ISEs) as having duplicate device names, which is an error, as all unit numbers must be unique.

Figure C–2 VMS Operating System Requires Unique Unit Numbers for DSSI Devices

Allocation Class=0	Nonzero Allocation Class (Example: ALLCLASS=1)
R7BUCC$DIA0	1DIA0 ◄ *Duplicate 0
R7CZZC$DIA1	1DIA1 ◄ *Duplicate 1
R7ALUC$DIA2	1DIA2 ◄ *Duplicate 2
R7EB3C$DIA3	1DIA3 ◄ *Duplicate 3
TFDR1$MIA5	1MIA5
R7IDFC$DIA0	1DIA0
R7IBZC$DIA1	1DIA1
R7IKJC$DIA2	1DIA2
R7ID3C$DIA3	1DIA3
R7XA4C$DIA4	1DIA4
R7QIYC$DIA5	1DIA5
R7DA4C$DIA6	1DIA6

* Nonzero allocation class examples with an asterisk indicate duplicate device names. For one of the DSSI busses, the unit numbers need to be reprogrammed to avoid this error.

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Note

You should configure your system to have unique unit numbers even if you have a standalone system using an allocation class of zero. That practice will avoid problems with duplicate device names if you later decide to form a cluster.

C.3 Examining and Setting DSSI Device Parameters

The following instructions describe how to change DSSI parameters, using the DUP driver utility. In the example procedures, the allocation class will be set to 2.

1. Enter the console mode.

   The procedure for programming parameters for DSSI devices from console mode requires that you issue commands to those devices at the console prompt >>>. You may enter the commands in either uppercase or lowercase letters. Unless otherwise instructed, enter each command, then press Return.

   Enter console mode as follows:

   a. Set the Break Enable/Disable switch on the system console module to the enable position (up, position |).

   b. Set the Power switch for each unit (both hosts for a dual-host system, and any expanders for expanded systems) to the on position (|).

   Wait for the system to display the console prompt (>>>).

2. To display the DSSI devices on embedded DSSI adapters, enter SHOW DSSI at the console prompt.

   The firmware displays two lines of information for each device. For embedded DSSI, the firmware displays the following.

   - The first line contains the bus number, node number, and node name.
   - The second line contains the device name and unit number followed by the device type in parentheses.

   For embedded DSSI, the device name consists of the letters DIA*u* or DIB*u* (MIA*u* or MIB*u* for the TF-series tape drive. Devices on bus 0 are listed as DIA. The embedded DSSI host is identified by an asterisk (*).

```
>>>SHOW DSSI
DSSI Bus 0 Node 0 (R7ALUC)
-DIA0 (RF73)
DSSI Bus 0 Node 1 (R7EB3C)
-DIA1 (RF73)
DSSI Bus 0 Node 2 (R7EB22)
-DIA2 (RF73)
DSSI Bus 0 Node 5 (TFDR1)
-MIA5 (TF85)
DSSI Bus 0 Node 6 (*)

>>>
```

Note

The DUP driver examples throughout this appendix are for RF-series ISEs. The displays for the TF-series tape drive differ slightly from the RF-series displays.

C.3.1 Entering the DUP Driver Utility

To examine and change DSSI parameters, you must first activate the DUP driver utility by setting host to the specific device for which you want to modify or examine parameters.

Use the following command for embedded DSSI.

```
>>>SET HOST/DUP/DSSI (<node_number>) PARAMS
```

where (<node_number>) is the bus node ID (0–6) for the device on the bus.

In the following example, SET HOST/DUP/DSSI 0 PARAMS is entered to start the DUP driver for the ISE at node 0 of embedded DSSI bus 0.

```
>>>SET HOST/DUP/DSSI 0 PARAMS
Starting DUP server...
Copyright (c) 1991  Digital Equipment Corporation

PARAMS>
```

If you wish to examine DSSI bus node 1, enter

```
>>>SET HOST/DUP/DSSI/BUS:1 0 PARAMS
```

C.3.2 Setting the Allocation Class

After entering the DUP driver utility for a specified device, you can examine and set the allocation class for the device as follows.

1. At the PARAMS> prompt, enter SHOW ALLCLASS to check the allocation class of the ISE to which you are currently connected.
2. Enter SET ALLCLASS 2 (or enter the allocation class you desire).
3. Enter SHOW ALLCLASS to verify the new allocation class.

This example shows the steps for examining and changing the allocation class for a specified device. The allocation class is changed from 0 to 2.

```
PARAMS>SHOW ALLCLASS
Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
ALLCLASS                0                0      Byte    Dec   B

PARAMS>SET ALLCLASS 2
PARAMS>SHOW ALLCLASS

Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
ALLCLASS                2                0      Byte    Dec   B
```

C.3.3 Setting the Unit Number

After entering the DUP driver utility for a specified device, you can examine and set the unit number for the device as follows.

1. At the PARAMS> prompt, enter SHOW UNITNUM to check the unit number of the ISE to which you are currently connected.
2. Enter SET UNITNUM 10 (or enter the unit number you desire).
3. Enter SET FORCEUNI 0 to override the default unit number value supplied by the bus node ID plug.
4. Enter SHOW UNITNUM to verify the new unit number.
5. Enter SHOW FORCEUNI to verify that the current value for the FORCEUNI parameter is 0.

   This shows the steps for changing the unit number of a specified device from 0 to 10.

```
PARAMS>SHOW UNITNUM
Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
UNITNUM                 0                0      Word    Dec   U

PARAMS>SET UNITNUM 10
PARAMS>SET FORCEUNI 0
PARAMS>SHOW UNITNUM

Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
UNITNUM                10                0      Word    Dec   U

PARAMS>SHOW FORCEUNI
Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
FORCEUNI                0                1   Boolean    0/1   U
```

6. Label the device with its unit number, using the unit number labels shipped with your system.

C.3.4 Setting the Node Name

After entering the DUP driver utility for a specified device, you can examine and set the node name for the device as follows.

1. At the PARAMS> prompt, enter SHOW NODENAME to check the node name of the ISE to which you are currently connected.
2. Enter SET NODENAME SYSDSK (or enter the desired alphanumeric node name of up to eight characters).
3. Enter SHOW NODENAME to verify the new node name.

This shows the steps for changing the node name of a specified device from the factory-supplied name to SYSDSK.

```
PARAMS>SHOW NODENAME
Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
NODENAME          R7CZZC            RF73        String  Ascii   B

PARAMS>SET NODENAME SYSDSK

PARAMS>SHOW NODENAME

Parameter     Current           Default        Type     Radix
--------- ---------------  ---------------  --------  -----
NODENAME          SYSDSK            RF73        String  Ascii   B
```

C.3.5 Setting the System ID

Note

This parameter is modified only when replacing a device. Only Digital service representatives and licensed self-maintenance customers should remove devices. All parameters for the replacement device should be programmed to match those of the original device.

After entering the DUP driver utility for a specified device, you can examine and set the system ID for the device as follows.

1. At the PARAMS> prompt, enter SHOW SYSTEMID to check the system ID of the device to which you are currently connected.
2. Enter SET SYSTEMID *System ID* (enter the desired serial number-based system ID).
3. Enter SHOW SYSTEMID to verify the new system ID.

This shows the steps for changing the system ID of a specified device from the factory-supplied ID to 1402193310841 (the system ID for the replacement device is programmed to match that of the original).

```
PARAMS>SHOW SYSTEMID
Parameter     Current           Default        Type     Radix
--------- ---------------  ----------------  --------  -----
SYSTEMID     0402193310841     0000000000000  Quadword    Hex   B

PARAMS>SET SYSTEMID 1402193310841

PARAMS>SHOW SYSTEMID

Parameter     Current           Default        Type     Radix
--------- ---------------  ----------------  --------  -----
SYSTEMID     1402193310841     0000000000000  Quadword    Hex   B
```

C.3.6 Exiting the DUP Server Utility

After you have completed setting and examining DSSI device parameters, enter the WRITE command at the PARAMS> prompt to save the device parameters you have changed using the SET command. The changes are recorded to nonvolatile memory.

If you have changed the allocation class or node name of a device, the DUP driver utility will ask you to initialize the controller. Answer Yes (Y) to allow the changes to be recorded and to exit the DUP driver utility.

If you have not changed the allocation class or node name, enter the EXIT command at the PARAMS> prompt to exit the DUP driver utility for the specified device.

This shows the procedure for saving parameter changes. The controller is initialized.

```
PARAMS>WRITE
Changes require controller initialization, ok? [Y/(N)] Y

Stopping DUP server...
>>>
```

This example shows the DSSI busses for the embedded DSSI adapters after the unit numbers for the disk devices on bus 0 have been changed from 0, 1, and 2 to 10, 11, and 12. The bus 0 device names are now DIA10, DIA11, and DIA12.

```
>>>SHOW DSSI
DSSI Bus 0 Node 0 (SYSDSK)
-DIA10 (RF73)
DSSI Bus 0 Node 1 (R7EB3C)
-DIA11 (RF73)
DSSI Bus 0 Node 2 (R7EB22)
-DIA12 (RF73)
DSSI Bus 0 Node 5 (TFDR1)
-MIA5 (TF85)
DSSI Bus 0 Node 6 (*)
>>>
```

Note

You must repeat the procedures in this appendix for each device for which you want to change parameters.

Glossary

The glossary defines some of the technical terms used in this manual.

backup copy

A copy of data stored on a disk.

backup process

The process of making copies of the data stored on a disk so that you can recover that data after an accidental loss. You make backup copies on tape cartridges or on another disk.

binary

A number system that uses two digits: 0 and 1. They are represented in system circuitry by two voltage levels, and programs are executed in binary form.

bit

A binary digit; the smallest unit of information in a binary system of notation, designated as a 0 or a 1.

bus

A channel (a set of wires) along which communication signals in a computer system travel.

byte

A group of 8 binary digits (bits). A byte is one-quarter of a VAX system longword.

caddy

The holder for inserting a compact disc into a compact disc drive.

central processing unit

See CPU.

communications line

A cable along which electrical signals are transmitted. Devices or systems that are connected by a communications line can share information and resources.

console mode

The state in which the computer is controlled from the console terminal. You can put the system in console mode by pressing the halt button on the back of the system unit. Console mode is indicated by the console prompt (>>>) on the monitor screen.

console prompt

A prompt used for communication between the system manager and the computer when the computer is in console mode.

controller

A system component, usually a printed circuit board, that regulates the operation of one or more peripheral devices.

CPU

Central processing unit. The part of the system that controls the interpretation and execution of instructions.

daisy-chain

A group of systems linked together sequentially.

data

A formal representation of information suitable for communication, interpretation, and processing by humans or computers.

DECconnect

Digital's simple, cost-effective cabling system for extending Ethernet and terminal interconnections into offices and work areas.

DECconnect faceplate

See faceplate.

default

A value or setting that in most cases is *normal* or *expected*.

DEMPR

A multiport repeater that provides eight ThinWire Ethernet drops from a single standard Ethernet connection.

device

The general name for any unit connected to the system that is capable of receiving, storing, or transmitting data.

device name

The name by which a device or controller is identified in the system.

diagnostics

Programs, located in read-only memory, that detect and identify abnormal system hardware operation. (*See* ROM.)

disk

A flat circular plate with a coating on which data is magnetically stored in concentric circles (tracks). A disk resides permanently inside a disk drive, while a diskette is removable.

disk drive

A device that holds a disk. The drive contains mechanical components that spin the disk and move the read/write heads that store and read information on the surface of the disk.

Ethernet

A type of local area network based on Carrier Sense Multiple Access with Collision Detection (CSMA/CD).

faceplate

A wall receptacle that provides a single network connection for the system.

file

A collection of related information treated by the system as a single unit.

format

To prepare a disk, diskette, or tape to accept data.

formatted data

Data that is structured in a particular pattern to be understood by the system software.

ground

A voltage reference point in a system that has a zero voltage potential.

hard disk

A hard disk resides permanently inside a disk drive.

hardware

The physical components—mechanical and electrical—that make up a system. (*Compare with* software.)

head

The part of a fixed disk drive, diskette drive, or tape drive that reads, records, and erases data. Also called read/write head.

IEEE

Institute of Electrical and Electronics Engineers.

IEEE 802.3

An Institute of Electrical and Electronics Engineers (IEEE) standard describing the physical and data link layers of a local area network based on bus topology and Carrier Sense Multiple Access/Collision Detect (CSMA/CD).

LAN

Local area network. A high-speed communications network that covers a limited geographical area, such as a section of a building, an entire building, or a cluster of buildings. It is a privately owned communications network whose speed is upward of 1M bits/second.

LED

Light-emitting diode. LEDs are used as indicators on the system enclosure.

load

To copy software (usually from a peripheral device) to memory. To physically place a disk in a disk drive or a tape in a tape drive.

Local Area Network

See LAN.

magnetic tape

A tape used for storing data that is made of plastic and coated with magnetic oxide. Also called magtape.

memory

The area of the system that electrically stores instructions and data, often temporarily.

memory module

A printed circuit board that contains additional memory for the system.

module

A printed circuit board that contains electrical components and electrically conductive pathways between components. A module stores data or memory or controls the functions of a device.

multiport repeater

A repeater used to connect two or more cable segments. The repeater lets you extend Ethernet networks beyond the limits imposed by a single segment. Repeaters perform the basic actions of restoring signal amplitude, waveform, and timing amplitude to normal data and collision signals.

network

A group of individual computer systems that are connected by communications lines to share information and resources.

network co-ordinator

The network co-ordinator manages the network, assigns unique node names and addresses for each system on the network, and provides administrative assistance to network users.

node

An individual information-processing unit, such as a computer, workstation, or peripheral device, that is connected to a network. A node is an end point to any branch of a network or a junction common to two or more branches.

operating system

A collection of system programs that controls the operation of the system and allows the user to access data files, input/output devices, and applications programs. The operating system software performs such tasks as assigning memory to programs and data, processing requests, and scheduling jobs.

peripheral

A device that provides the CPU with additional memory storage or communication capability. Examples are disk and diskette drives, video terminals, and printers.

port

The name of the socket or connector at the back of the computer to which a terminal, printer, or other communication devices are connected.

printer

A peripheral device that provides paper copies of information stored on the system.

prompt

Words or characters that the system displays to indicate that it is waiting for you to enter a command.

RAM

Random-access memory. Memory that can be both read and written to and can randomly access any location during normal operations. The type of memory the system uses to store the instructions of programs currently being run. *Compare with* ROM.

random-access memory

See RAM.

read-only memory

See ROM.

ROM

Read-only memory. A memory whose contents cannot be modified. The system can use the data contained in a ROM but cannot change it. *Compare with* RAM.

SCSI

Small computer system interface. It is an interface designed for connecting disks and other peripheral devices to computer systems. SCSI is defined by an American National Standards Institute (ANSI) standard and is used by many computer and peripheral vendors throughout the industry.

SIMM

Single inline memory module. This refers to the physical shape of the memory module.

Small computer system interface

See SCSI.

software

Programs executed by the system to perform a chosen or required function. (*Compare with* hardware.)

standard Ethernet

IEEE standard 802.3 compliant Ethernet network composed of standard Ethernet cable as opposed to ThinWire Ethernet cable.

storage medium

Any device capable of recording information; for example, a diskette.

store

To enter data into a storage device, such as a disk, or into memory.

system

A combination of system hardware, software, and peripheral devices that performs specific processing operations.

tape drive

A device that contains mechanical components and holds, turns, reads, and writes on magnetic tape.

tape leader

A plastic leader at the beginning of magnetic tape.

tape lever

This lever sets internal TZ30 mechanisms to accept or eject the tape cartridge. Move the lever to the left to insert a tape, move to the right so the tape can be used, and move to the left again to eject the cartridge after the tape has been completely rewound.

T-connector

Connector used to join ThinWire Ethernet cable sections. The connector also has a connector that is attached directly to a system.

terminal

An input/output device that lets you communicate with the system. Terminals are divided into two categories: video and hard-copy.

terminator

A connector used on one or both ends of an Ethernet segment that provides the 50-ohm termination resistance needed for the cable.

ThinWire

A Digital trademark used to describe its 10 base 2 (IEEE standard 802.3 compliant) Ethernet products used for local distribution of data.

ThinWire connector

The connector on the back of the system unit to which the ThinWire Ethernet cable is attached.

transceiver

A device that provides a single physical connection between standard Ethernet and Ethernet communication equipment.

unload switch

A switch on the front of the TZ30 tape drive that rewinds and unloads the tape.

VMS

Digital's proprietary operating system.

write-protect

To protect a disk, diskette, or other storage medium from the addition, revision, or deletion of information.

write-protect switch

The switch that you set on tapes, cartridges, or diskettes to prevent loss of data by accidental overwriting.

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